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&c. &c.

CLINICAL RECORDS

OF

INJURIES AND DISEASES

OF THE

GENITO-URINARY ORGANS

BY

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TO

MY FORMER PUPILS IN THE RICHMOND HOSPITAL,

With whom for many years I worked and studied,

From whom I always received the greatest kindness,

and

Whose friendship I so highly value,

I dedicate this Book,

The result of our joint labours,

As a proof of

The affectionate remembrance in which I hold their gentle
Forbearance and constant Loyalty to me.

P R E F A C E .

THE opportunities afforded, in this city, for the study of injuries and diseases of the Genito-urinary Organs, and for the investigation of their pathology, can scarcely be elsewhere surpassed. Numerous examples of these important affections have come under the observation of the author, from amongst which he has selected those of most practical value occurring in hospital, with a few arising in private practice. An account is given of those cases, accompanied by such remarks as their peculiarities appeared naturally to suggest—records of this description constituting, perhaps, the most reliable basis for the advancement of surgical knowledge. No systematic treatise is attempted, neither can it be said that any consecutive nosological order is observed. The author merely adopts such an arrangement as appears to him best calculated to elucidate the practical bearings of the subject upon which he treats; and he trusts that the illustrations will be found useful to the student, as

a kind of epitome of the maxims contained in the text.

The Dublin surgeon will at once recognise the truthful pencillings of Messrs. Conolly and Oldham in these delineations, and approve the admirable manner in which the lithographs have been executed by Mr. Lewis. Their artistic merits are of the highest order. The author entertains the hope that the illustrations of the morbid conditions of the urine will be found instructive, and that they will tend to vitalize the written descriptions given, and render them more impressive. The original drawings have been exhibited at his clinical lectures from the date of the appointment of the author as surgeon to the Richmond Hospital, and are at present amongst the collection in the Museum of the Hospital. Portions of the text have already appeared in various communications—in the “Dublin Quarterly Journal of Medical Science,” the “Dublin Medical Press” the “Hospital Gazette,” and the “Reports of the Proceedings of the Pathological Society” of this city.

The author has intentionally omitted references, by name, to the writings of others on the subject upon which he treats—not from any want of a due estimate of their respective merits, but rather influenced by the consideration that his main object has been merely to assist the advanced student in an investigation at

once important and intricate, by placing before him practical precepts deduced from prolonged and anxious clinical study.

He cannot express as he would wish his grateful acknowledgments to the Editor of these Records for the zealous industry he has manifested in their arrangement and compilation. He merits the author's warmest thanks.

DUBLIN, *February*, 1877.

'The Author may be pardoned for here publishing the Address which was publicly presented to him in the theatre of the hospital, by his pupils, on the occasion of his resignation as surgeon.

“TO CHRISTOPHER FLEMING, A.M., M.D., DUB.,

Ex-President R. C. S. I., F. R. C. S. I., M. R. I. A.,

Member of the Court of Examiners R. C. S. I., late Surgeon to the Richmond Hospital, &c., &c., &c.

“DEAR SIR,

“We, the undersigned, present and former Students of the Richmond Hospital, having heard of your resignation, desire to give expression to our extreme regret at your retirement from amongst us.

“While doing so, we avail ourselves of this opportunity to convey to you those sentiments of respect, esteem, and gratitude, which your connexion with us has inspired.

“We have found in you an Instructor at all times ready to impart information; a Surgeon on whose judgment and experience we might

safely rely; one whose zeal we would do well to emulate, and a friend whose counsel was ever at our disposal.

"We thank you for your valuable instruction. We admire the success with which your skill has been directed to the relief of human suffering. We feel stimulated by the example of your zealous efforts for the advancement of the science of our profession, and we remember with appreciation, and are deeply grateful for, the friendly courtesy which has ever characterised your bearing towards us.

"We sincerely hope that you may long be spared to enjoy the position which, by your high professional attainments and indomitable energy, you have justly earned.

James Alexander.

Henry Algeo.

P. Allen.

Thomas Allman.

James Armstrong.

J. D. Baskerville.

W. Bolton.

Q. Austin Boyd.

W. T. Bradshaw.

B. W. Brereton.

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M. C.

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C. S. I.

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F. A. Smythe, A. B.

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T. W. Warren.

C. O. Wiley.

Gerald F. Yeo, A.B., M.B.,

M. Ch.

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CORRIGENDA.

Page 116, line 1, *for* pubis, *read* pubes.

— 177, line 2, *for* calculus, *read* calculi; *for* was, *were*.

— 207, *for* fig. 3, *read* fig. 4, and *vice versa*.

— 224, line 4, *for* inflammation, *read* specific inflammation.

— 254, line 5, from bottom: *for* ever, *read* never.

INJURIES AND DISEASES

OF THE

URINARY ORGANS.

CHAPTER I.

THE PATHOLOGY OF THE URINE IN ITS RELATIONS TO SURGERY.

A MORBID condition of the urine being almost necessarily connected with injuries and diseases of the urinary organs, it will not be deemed inapposite to offer a few observations on what may be termed the surgical pathology of that fluid. It is not my intention to enter upon the consideration of the subject at any length, the pathology of the urine in the widest acceptation of the term and in its most minute details having already received a large amount of attention. To these details considerable importance is justly attached, and a knowledge of them is essential to the understanding of the many morbid alterations to which the fluid in question is liable. The student of surgery should, therefore, never lose sight of the practical

fact that, in the list of the injuries and diseases of the urinary organs which he may be called upon to investigate, complications may exist which will render the general knowledge I allude to of the highest importance. Thus the diagnosis of traumatic hæmaturia and its varieties may be determined. Albuminous nephritis from scarlatina has escaped detection in a child with stone in the bladder, upon whom lithotomy had been performed previously to the discovery of the unhealthy condition of the urine. Again, Bright's disease of the kidney has had a sudden and fatal termination by uræmic poisoning, when the disease treated by the surgeon was supposed to have been ordinary stricture of the urethra; and unsuspected diabetes has carried off a patient labouring under retention of urine, considered as ordinary retention from chronic enlargement of the prostate gland. Nay, more, whilst these pages were passing through the press, a case came under my observation, the details of which will be given hereafter, in which diabetes co-existed with a most aggravated stricture of the urethra and was wholly overlooked. Error of diagnosis in such cases may fairly be attributed to neglecting the examination of the urine.

The mode of studying the surgical pathology of this excretion which I have found best calculated for clinical instruction, has had for its object the conditions perceptible to the eye which the urine presents during and subsequent to its discharge from the bladder. Accurate observation of the characters of the fluid exhibited at these periods furnishes the surgeon with most important information, and will enable him to

form a tolerably correct opinion as to the nature of the morbid products which may present themselves, the ascertaining of which by the analytic examinations in ordinary use may not be within his reach at the time.

The appearances which in this method of investigation are best calculated to guide the opinion of the surgeon, are the colour of the urine as it flows from the urethra and is afterwards collected, and the deposits which may ultimately take place in it. Thus, the varying tints of the urine; its uniform transparency or otherwise; the nature of the deposits as to shade and outline, and the characters of the supernatant fluid, constitute a mass of evidence most useful in its practical bearings, and often so conclusive as to dispense with the necessity of further examinations by the microscope or by chemical analysis. From a very large experience, I can speak with much confidence as to the efficiency of this mode of determining the pathological conditions of the urine, as well as to its great value in directing our treatment. The means whereby it is accomplished are very simple. No complicated apparatus is required, and the eye quickly becomes familiar with appearances which are not only remarkably limited as to variety, but are also most characteristic as to outline.

In the examination of the respective specimens, care should of course be taken to avoid all sources of fallacy; and much circumspection is required on the part of the surgeon, as regards the identity of the particular specimen under observation, the period and

the mode of collecting it, and the certainty of its total freedom from any of those extraneous matters which might be either accidentally or intentionally introduced into it. It may appear unnecessary to refer to these precautions, but it must be acknowledged that there is often carelessness in conducting such investigations, and hence erroneous conclusions are arrived at. I have myself always been most particular respecting any specimen I wished to examine, and when it is at all feasible, I endeavour to observe and to secure the urine whilst it is escaping or being removed from the bladder, when I transfer the quantity required into special test-glasses, such as those delineated in several of the illustrations given. These glasses contain, when full, about two ounces of fluid, are suited to the urinometers in daily use, and give an approximate estimate of the amount of deposit which may be present in any given specimen.

With the impression on my mind that illustrations of the appearances I allude to would be more instructive to the pupil than their mere description, I have had sketches of the original drawings exhibited for many years at my lectures, chromo-lithographed, as in the adjoining plate (Plate I.), in which I have arranged the several specimens numerically and in the order of their frequency of occurrence in practice, a note of the physical properties which are usually co-existent in each variety being added. By examination of the shades of colour of the urine as represented in each figure, and by attention to the tints and surface-outline of the accompanying deposits, a knowledge

PLATE 1.

FIG. 1.



FIG. 2.



FIG. 3.



FIG.
4.

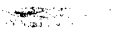
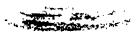


FIG. 7.

FIG. 8.

FIG. 9.

MR. FLEMING

THE URINE IN ITS SURGICAL RELATIONS.

EXPLANATION OF PLATE I.

ILLUSTRATIONS OF THE VARIETIES OF MORBID URINE, ARRANGED IN THE USUAL ORDER OF THEIR OCCURRENCE, INDICATING THE PECULIARITIES OF COLOUR OF THE SUPERNATANT FLUID AND OF THE ACCOMPANYING DEPOSITS IN THE RESPECTIVE SPECIMENS, WITH THE DENSITY AND CHEMICAL REACTION OF EACH.

URINARY DEPOSITS.

AMORPHOUS AND CRYSTALLINE.

Uric Acid and its compounds,	Fig. 1.
Oxalate of lime,	Fig. 2.
Phosphates,	Fig. 3.

NON-CRYSTALLINE.

Blood,	Figs. 4 and 5.
Pus,	Fig. 7.
Mucus,	Figs. 8 and 9. γ

MIXED.

Pus with amorphous and crystalline deposits, . .	Fig. 7.
Blood and Mucus with do.,	Fig. 6.

will be almost imperceptibly acquired which will be found most practical. I have omitted no opportunity of testing by comparison with recent specimens the accuracy of those illustrated in the plate, and I am therefore not without a hope that they will be recognized as truthful copies from nature, and as accurate typical representations of those conditions of the urine presented so frequently to the surgeon in connexion with the injuries and diseases of the urinary organs.

Thus, Figures 1, 2, and 3 show remarkably well the varying colours of the urine associated with "amorphous and crystalline" deposits, whether uric (1), oxalic (2), or phosphatic (3), in their nature; Figures 4, 5, and 7 illustrate the shades of urine accompanying the "non-crystalline deposits;" and 6, 8, and 9 point to the several conditions indicative of the "mixed deposits," or the combinations of one or more of the above with each other. Such systematic groupings of specimens will, it is hoped, facilitate the study of this important subject, and help to lessen its difficulties; but I cannot enforce too strongly on the mind of the student the absolute necessity of still further extending his researches, by consulting those authors who have of late so successfully investigated the subject of urinary pathology. He will thus learn the physical properties of the urine in health and in disease, will become familiar with its microscopical peculiarities, and will be enabled to form a proper estimate of the value of attention to its external characters in their strictly clinical application. Let him not, however, be too confident in his conclusions.

Here, as in any other branch of medicine and surgery, he will find appearances deceptive and will have reason to regret if his opinions be too dogmatical. Doubtless, in the vast majority of cases, from the external characters of the urine its physical and microscopical features may be predicted, but I have met with not a few cases in which that anticipation has been contradicted by subsequent analytic examinations.

It is not requisite to do more than briefly touch on some of the leading points suggested by the above remarks, as constant reference must necessarily be made to them throughout the text. In glancing at the several figures sketched in the plate, with a view to the distinctive characters of the specimens of urine illustrated, it will be found that very marked differences are discernible in each, which it is important to bear in mind. Thus, in Figs. 1, 2, and 3, the colour of the supernatant urine and that of the accompanying deposit will attract attention, and in descending the scale the several peculiarities exhibited cannot be overlooked. By far the most frequent deposit to be met with in the urine is that delineated in Fig. 1. Almost peculiar to childhood, it is more common in adult than in advanced life, and presents itself to the surgeon on very many occasions where much constitutional disturbance attends on injuries or diseases, no matter where they may be situated or what their nature may be. In erysipelatous, pyæmic, and other analogous inflammations it is seldom absent, and in tetanus and hydrophobia it constitutes an almost constant symptom. It usually indicates a mordid con-

dition of urine traceable rather to functional than to organic derangement, and is not necessarily productive of urinary irritation; whilst in other instances a train of most distressing urinary symptoms is attributed to it. The urine is usually more or less of an amber colour; it is perfectly clear and transparent on being passed; and in proportion to the diminished temperature in which it may happen to be placed, it quickly becomes turbid, throwing down a deposit, the supernatant fluid retaining its transparency, although sometimes apparently otherwise from the interior of the test-glass being muffled with the deposit. This is very characteristic. It is very variable in its tint, but is generally flesh-coloured and opaque, though occasionally translucent. It is remarkably tremulous on gentle agitation, and when briskly shaken is miscible with the supernatant fluid, again subsiding on being placed at rest. It is frequently studded with minute reddish particles entangled throughout it. It very quickly disappears if the urine be placed near the fire, or if the test-glass containing it be immersed in hot water, or if hot water be added to it. This deposit is the urate of ammonia or soda, with or without free uric acid. It affords a striking contrast to the deposits represented in the adjoining Figures 2 and 3, the former exhibiting the appearance of urine containing oxalate of lime in excess, and the latter illustrating that containing phosphates in excess, each with its accompanying deposit.

The lighter shade of colour of the urine visible in the supernatant fluid in Fig. 2 is familiar to all who

have directed attention to the subject, and its deposit, an outline of which I have not seen elsewhere delineated, is very remarkable. It is a semi-transparent, tomentous, floating mass, often an inch or so in depth, having an irregularly undulating, though defined, outline. With such a deposit, oxalate of lime exists in considerable quantity, and under the microscope the presence of myriads of its minute, well-defined, octahedral crystals will be observed. Such deposit is not often met with in the class of patients admitted into hospital. A few large crystals of oxalate of lime are usually seen in the uric deposit (Plate II., *a*), but they are quite apart from the numerous and distinct crystals which indicate the true oxalate of lime diathesis. It is an interesting fact, and one worthy of investigation by those who have directed their attention to the sources of the principal constituents of the urine in health and in disease, that this particular description of urine very often undergoes a complete change *in twelve or fourteen hours after being passed, uric acid crystals appearing in large quantities*, and being visible to the naked eye as minute, brownish red specks, scintillating through the peculiar tomentous deposit, or coating the interior of the test-glass, and communicating to the touch a distinct gritty feel, although none such were previously discernible even under the microscope.

In Fig. 3 a condition of urine is represented which quickly attracts the attention of the patient, and excites great alarm. Such urine is perfectly opaque, and is of a whitish turbid colour *at the moment of being*

passed. Minute pulverulent looking granules soon present themselves, floating throughout it as it cools, and increasing in number. They quickly fall to the bottom of the test-glass, and form an opaque deposit of a French white colour, often a quarter of an inch or more in depth, and having an abrupt and well-defined marginal outline. The supernatant fluid is perfectly transparent, and of a pale greenish-yellow hue, being uniformly miscible with the deposit on agitation, and again becoming clear as the deposit is reproduced. This condition of urine is frequently met with both in the male and in the female. I have but seldom seen it in advanced life or in children, and it is the only "amorphous or crystalline" deposit which I can bring to my recollection, as being present in the urine to such an amount as to render that fluid completely turbid *during the act of micturition*, whilst it retains its acid reaction, and is devoid of any appreciable amount of mucus. The deposit represented in Fig. 1 is often very copious, and will render the urine muddy, and perhaps somewhat whitish, especially in children. This change, however, occurs *subsequently to the urine being voided*, and when its temperature is reduced. Augment the temperature of such urine, and the turbidity disappears: whereas in the other case it is rather increased. Uric acid crystals, or "red sand" as they are sometimes termed, may doubtless escape in large quantity from the bladder as such, and may be quite visible to the naked eye, particularly if the urine is collected in an ordinary chamber utensil; the urine, however, retains its transparency

during micturition, and the deposit is not uniformly mixed with it. In the specimen referred to in Fig. 3, the deposit, which I have always found to be phosphatic, is disseminated through the fluid as it escapes from the bladder, and its differential diagnosis can be calculated upon with certainty when the other external characters specified are found to be co-existent.

In no morbid state of the urine is attention to its external characters more practically useful than in those in which blood, pus, or mucus exists singly or conjointly in it. The appearances of the urine under such circumstances are well shewn in Figs. 4, 5, and 7. Where blood is present, as in hæmaturia, traumatic or otherwise, the shades of colour and its uniformity of tint are liable to great variety, and are influenced by accidental circumstances, but principally by the source from which the blood is derived, and by the existing physical characters of the fluid. Thus Fig. 4 exhibits a dark chocolate colour almost pathognomonic of renal hæmaturia; whilst Fig. 5 indicates that bright, prune-juice tint often pathognomonic of malignant disease of the bladder. Much lighter tints, however, may indicate the presence of blood in the urine, and as in many of these varieties there is not necessarily a defined red deposit indicating it, great caution must be observed in an investigation respecting its presence, and in doubtful cases the assistance of the microscope should always be had recourse to.

In purulent urine, or what may be termed pyuria, the external pathognomonic indications are tolerably clear. The colour of the secretion when being passed

is often like that of milk or whey, the supernatant fluid being limpid and pale, and more or less opaque when the urine is allowed to rest. Here also, however, the uniformity of colour is variable; it is more remarkable in many instances at the commencement and at the end of micturition, in the intervening period being comparatively clear. The deposit in this description of urine is very well defined. It has a greenish-yellow hue of peculiar tint, with a distinct surface-outline (Fig. 7), is perfectly miscible with the supernatant fluid on agitation, and again subsides on resting, reassuming its original external characters. It contrasts strongly with the phosphatic deposit above described, and cannot be mistaken for it, if the characteristic features of each be carefully examined. It forms an equally striking contrast with that state of the urine, in which mucus constitutes the leading morbid feature. Here, the colour of the fluid is greenish and clouded; the deposit a dirty white, often semi-transparent; its surface-line rough and irregular, and, when the reaction of the urine is neutral or alkaline, its consistence ropy and glutinous; a portion of it being more or less adherent to the bottom of the test glass; whilst the remaining portion floats, when shaken, in a lengthened continuous mass throughout a supernatant muddy fluid. Each of these two last descriptions of urine may be mixed with blood, the latter either forming a reddish stratum on the surface of the deposit, or being more or less uniformly diffused through it. In Figs. 6, 7, 8, and 9 these conditions are represented.

In reviewing this chart (Plate I.), it is not to be imagined that an attempt has been made to include all the morbid conditions which the urine may present to the notice of the surgeon. Every day's experience must convince the clinical observer, how impossible it is to do more than generalize appearances which are so much influenced by circumstances, the occurrence of which cannot be calculated upon in any given case. It is the practical application of the external characters alluded to which it is desired to inculcate the study of, by comparing them one with the other, by noting their distinctive features, and by pointing out the proper adaptation of each to the other in the injuries or diseases in which they may be present, until opportunities are afforded for the more minute investigation of their physical and microscopic characters. The attentive and observant pupil will soon recognize their respective peculiarities by studying the chart.

Plate II. is to a certain extent explanatory of the important object contemplated in this inquiry, all the figures in it having reference to cases of stone in the bladder, hereafter detailed, in which the operation of lithotomy had been performed; the differential diagnosis as to the nature of the stone existing in each case, having been based upon the knowledge previously derived from the study of the external characters of the urine, and having been confirmed by subsequent analysis. In Plate I., also, will be recognised throughout the several figures the appearances which the urine in its morbid conditions so constantly exhibits in practice; and arranged as the several deposits are,

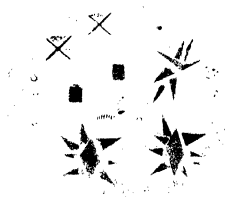
in their crystalline, non-crystalline, and mixed varieties, their respective peculiarities will readily attract attention. Be the deposits uric, oxalic, or phosphatic, be they pus, blood or mucus, a mixture of one deposit with the other, or a commixture of all, the mode of investigation suggested will, it is hoped, be found instructive and useful for clinical researches. The study of the physical characters of the urine, however, must not be neglected, and microscopical aid must be had recourse to, to render our conclusions accurate.

If we now consider injuries and diseases of the urinary organs, the presence of which may be tested or confirmed by morbid changes in the urine, we shall find no difficulty in identifying them with the figures in the chart. Thus, if we pass them in review, no morbid condition of urine is more frequent than that of the excess of uric acid, or of the urates noted in Fig. 1. Lumbar uneasiness, abdominal griping pains, irritable bladder, incontinence or even retention of urine both in childhood and in advanced life, are constantly referrible to it; and there is no more fruitful source at all periods of life of urinary concretions or calculi, whether renal or vesical. The rare occurrence of oxalate of lime as an isolated deposit in the urine has already been noticed; but it is to be borne in mind that it is constantly associated with uric deposits and with uric calculi, and this at all periods of life. The local symptoms attendant on this condition of urine are similar to the former, although often more intense in their character, and accompanied with greater derangement of health. In cases of the phos-

FIG.
1.



FIG.
4.



CANADIAN
FIG.
2.



FIG.
5.

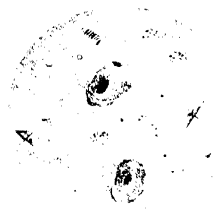


FIG.
3.



FIG.
6.



EXPLANATION OF PLATE II.

ILLUSTRATIONS OF THE MORBID CONDITIONS OF THE URINE (FIGS. 1, 2, AND 3,) PRESENT IN THE VARIETIES OF VESICAL CALCULI EXHIBITED IN THE PLATE.

Microscopical appearances of the "MIXED URINARY DEPOSITS" accompanying each of the specimens.

- a. Yellowish-coloured rhomboidal and lozenge-shaped crystals of uric acid. Molecular globules of urate of ammonia. Octahedral crystals of oxalate of lime. Groups of blood and pus corpuscles.
 - b. Numerous octahedral crystals of oxalate of lime, some large, others very minute and of different shapes. Blood and pus corpuscles aggregated in masses. Vesical epithelium.
 - c. Different forms of triple-phosphate crystals. Granules of phosphate of lime. Small globular masses of urate of ammonia (soda ?) studded with irregular acicular offsets of uric acid. Mucus corpuscles united in groups.
- Figs. 4, 5, and 6. Appearances externally and on section of calculi removed from patients, the conditions of whose urine are delineated in Figs. 1, 2, 3, and a, b, and c respectively.

CHEMICAL COMPOSITION OF CALCULI.

ANALYSIS BY T. W. GRIMSHAW, M. D.

- Fig. 4. Nucleus composed of uric acid and urate of ammonia; the portion next the nucleus, of oxalate of lime, and the surface, of fusible phosphates.
- Fig. 5. Nucleus composed of uric acid and urate of ammonia; remaining portion, oxalate of lime, with trace of ammonio-magnesian-phosphate externally.
- Fig. 6. Nucleus, uric acid and urate of ammonia. The rest of this calculus consists of phosphate of lime, ammonia, and magnesia, with traces of oxalate, especially near the nucleus.

phatic deposit delineated in Fig. 3 (Plate I.), there is often very considerable disturbance of health evinced by lassitude and a peculiarly anæmic aspect; but in no case which I have met with has there been discoverable any serious organic lesion, and the return to a healthy urinary excretion has been quickly effected by tonic and dietetic management. The irritability of the bladder in such cases does not form a very prominent complaint on the part of the patient; and although as a rule it exists to a greater or less degree, it may be altogether absent, and hence the remarkably altered condition of the urine excites more alarm in the mind of the patient.

CHAPTER II.

OBSTRUCTIONS OF THE URETHRA FROM INJURY.

HAVING regard to the train of symptoms usually attendant on injuries and diseases of the urinary organs, especially in their more aggravated forms, we must admit that retention of urine, partial or complete, constitutes a prominent and important feature, that it presents itself more or less in most instances, and that it always interrupts the healthy functions of the bladder. It is a most distressing and painful symptom, requiring prompt relief and demanding on the part of the surgeon great judgment as to the appropriate treatment. Referrable to many causes apart from those which may originate in the kidneys or in the bladder, retention of urine is often traceable to obstructions in the tract of the urethra, which may suddenly supervene quite irrespective of any local disease in that canal. Injuries inflicted on the urethra afford excellent examples of some of the obstructions which may occur in the absence of local disease, whilst on the other hand diseases implicating the urethra itself, or elsewhere originating and in their progress interfering with its functions, constitute another important class. These obstructions may be

the result of violence applied from without or from within that canal, and may or may not implicate its integrity, such as contusions, or wounds from ordinary accidental causes, complicated fractures of the pelvis, false passages from the introduction of instruments or other foreign materials, and lacerations connected with the escape of calculi from the bladder, or with the several operations for their removal. The following cases will answer as illustrations.

CASE I.

Contusion of the Perinæum.—Effusion of Blood into the Scrotum.—Partial Retention of Urine.

A baker's boy, aged between 17 and 18 years, and in good bodily health, was kicked in the perinæum from behind by a fellow-workman, whilst in the act of stooping forward. He became faint and sick at the moment, and suffered very great pain in the seat of the injury. I saw him in about six hours afterwards; he was then in a state of painful collapse, had not passed any urine, and expressed himself unable to do so. The scrotum was largely swollen and discoloured, the adjoining portion of the perinæum was equally so, and there were pain and considerable hardness on pressure in that locality. There was no bleeding from the urethra, neither had the boy any desire to pass water immediately after the accident. Now, however, the desire was urgent and the bladder was full of urine. The general symptoms present were

fairly attributable to fright and the shock of the accident. During my visit I induced him to make the attempt to pass water in the erect posture, and he succeeded. The urine escaped very slowly, without much pain, and was perfectly natural in appearance. I sent him to hospital, and requested that under no circumstances should a catheter be introduced without communicating with me. Some constitutional treatment was directed, and next day I found that the boy had emptied his bladder, and that he was free from suffering of any moment. There was no increase in the swelling of the perinæum or scrotum, but their integument was black from infiltrated blood, as was that of the penis. At the end of a fortnight the patient left the hospital, a catheter having been introduced on two or three occasions to secure the integrity of the canal of the urethra in the subsequent curative stages of the injury.

CASE II.

Contusion of the Perinæum.—Effusion of Blood into the Scrotum and the Perinæum.—Retention of Urine.

Whilst a boy, aged three years, was playing with his brother in a room, his foot slipped into an opening in the boards of the flooring, when, his brother stumbling over him, the whole limb was jammed in to its full length up to the perinæum and was with difficulty extricated. Beyond a slight superficial scratch on the thigh, there was then no visible

sign of external injury, but within a few hours considerable swelling occurred in and around the scrotum, and the child having a desire to pass water found he was unable to do so. There was no bleeding from the urethra. The treatment adopted not having given relief, admission into hospital was sought for, and I saw him about sixteen or eighteen hours after the accident. The local evidence of extreme retention of urine was then present, the prominence of the distended bladder being traceable up to the umbilicus. The prepuce was as much distorted from the infiltration of colourless serum as in a case of aggravated anasarca; the scrotum and adjoining portion of the perinæum were tensely swollen, there was much tenderness on the slightest pressure over them, but there was no trace of discoloration of the integuments. The child was feverish, restless, and unmanageable, the more so as fruitless attempts had been previously made to pass a catheter into the bladder. Having placed him under the influence of chloroform, I succeeded in removing a large quantity of urine perfectly normal in appearance, and finding it utterly impracticable to leave the instrument in the bladder, I directed some soothing anodyne mixture, cooling applications to the swollen parts, and the most perfect rest in the horizontal posture. On the two following days it was necessary to draw off the urine; on the third, the swelling began to subside, the child recovered the power of emptying the bladder, the scrotum and perinæum were being restored to their natural condition, and within a week he left the hospital, none of the

ordinary marks of ecchymosis having presented themselves beyond the faintest yellowish tinge of the integument of the perinæum.

In neither of these cases was there reason to assume that the urethra had been lacerated, no hæmorrhage from it having occurred. In both of them the obstruction to micturition arose in a great measure from blood extravasated into the superficial and deeper tissues surrounding the urethra, and also, to a certain extent, into the wall of the urethra itself. These lesions, associated with the apprehension of suffering pain in the effort to pass water, caused the retention of urine. In the adult such cases of retention can usually be managed without the introduction of a catheter, but in the child recourse must often be had to it, the agony being usually so great that he becomes otherwise totally unmanageable. Chloroform should be used, as under its influence the bladder may happen to act spontaneously; or if not, a metallic instrument or a gum-elastic catheter, properly curved for a child, can at once be passed. To have introduced a catheter in the first case would have been more than hazardous, as no matter how gently managed, the urethra in its congested condition might have been seriously injured. At a later period, however, the passage of a suitable instrument was indispensable to prevent subsequent mischief, especially as the local effects of the accident had been severe. Under similar circumstances this precaution is usually very requisite, since from the history of many cases of

organic stricture of the urethra and from the ordinary seat of that obstruction, contusions of the perinæum, independent of absolute injury to the urethra, appear to be capable of producing that disease.

CASE III.

Extensive Laceration of the Perinæum.—Exposure of the Bulb of the Urethra.—Partial Retention of Urine.

A countryman, aged twenty-six years and in good health, acting as hod-man to a mason, lost his footing, and falling down a flight of six or eight stone steps unprotected by a balustrade, struck the perinæum against the edge of the last step, whilst his thighs were widely separated. He had the sensation at the time as if "the urinary passage was burst," and that the urine had escaped through the rent. His clothes were saturated with blood, and a wound was found to occupy nearly the whole line of the raphe of the perinæum, and so deep as to expose the tract of the urethra in the vicinity of the bulb. The hæmorrhage had been very profuse, and the man was so positive as to the escape of urine by the wound that, as a precautionary measure, a catheter had been introduced into the bladder previously to my visit to the hospital. There were then pain and some little difficulty in micturition, but there was no absolute retention of urine nor a symptom of hæmaturia. The integuments and the deep mesial septum of the perinæum were so completely lacerated, that the finger could be

freely passed to the bulb, which, however, appeared to be otherwise uninjured. With the aid of position, rest, and diet, an attempt was made to heal the wound by the adhesive process; yet some suppuration took place and cicatrisation was slowly accomplished. During the later reparative stages of the wound a full-sized silver catheter was occasionally introduced into the bladder. Before the lesion was fully healed the man insisted on leaving the hospital. He returned in about a week, complaining of irritability of the bladder, and asserting that urine did pass through the tract of the wound. I readmitted him. Some uneasiness was felt as a catheter traversed the region of the bulb, but I could never ascertain that any absolute communication existed between the canal of the urethra and the seat of the laceration. In about ten days he was discharged well, the wound being perfectly healed.

Fig. 1, Plate V., gives a good representation of the appearances existing soon after the accident occurred.

Wounds in the perinæum, apart from any apparent injury to the urethra, are often met with in hospital practice. Many which I have treated might fairly be classed amongst punctured or penetrating wounds. Thus, I have had under my care a boy, about ten years of age, absolutely staked by slipping on an iron paling, whereby the spiked end of one of the rails entered the perinæum, about midway between the anus and the scrotum, and passed obliquely through

EXPLANATION OF PLATE V.

ILLUSTRATIONS OF WOUNDS AND CONTUSIONS OF THE PERINÆUM AND SCROTUM.

- CASE III. Fig. 1. The situation of the wound specified in the mesian line of the perinæum is well shown, and its resemblance to that in Professor Symes' operation of "Perinæal Section," or in that of Mr. Allarton's of "Median Lithotomy," is remarkable.
- CASE IV. Fig. 2. The external characters present in the scrotum and the perinæum are well represented both as to colour and form. The situation of the testicles, and that of the blood extravasated, are very truthfully outlined. The appearance of bleeding from the urethra is also visible.
- CASE V. Fig. 3. The effects of urinary infiltrations into the scrotum, when followed by gangrenous cellulitis, and its extensive and diffused characters, are accurately delineated.
- CASE VI. Fig. 4. The congenital phymosis, the deformity of the penis, its unnatural breadth in the situation of the injury, the position of the testicles, and the limited extent of the blood extravasated in front of the scrotum are characteristic.

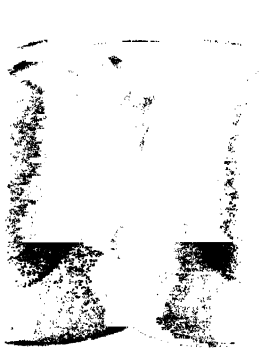
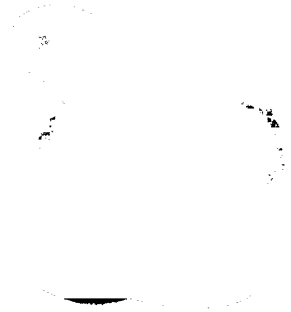


FIG. 3.



FIG. 4.



MR. FLEMING

ON INJURIES OF THE PERINÆUM AND OF THE PENIS.

the latter towards the arch of the pubis, the track of the wound being marked by a broad ecchymosed patch of the integuments reaching to the groin. Again, I have had under treatment a smith from a foundry, into whose perinæum a projecting piece of iron rod, about half an inch in diameter, and according to the statement of the man, some inches in length, forcibly entered deeply at a small distance from the front of the anus, causing a wound and considerable ecchymosis in the perinæum, and extending to the ischio-rectal fossa of one side. In these cases, as in almost all others of the same kind I have met with, some urinary irritation occurred and must necessarily be expected; but when there is no distinct evidence of urethral lesion or obstruction, such as hæmorrhage from the urethra or painful retention of urine, I believe there should never be an attempt to interfere with the canal by the introduction of instruments until all other expedients have failed. Absolute rest in the horizontal posture must be enjoined, the thighs kept closely approximated, attention paid to the state of the bowels and bladder, their action secured in the recumbent posture, mild anodynes administered, and restricted diet enforced. This general treatment, with cooling astringent or other suitable local applications, will often secure a favourable result. It is a curious feature connected with wounds in this locality, that the sensation of urine escaping along the track of the wound often exists. The surgeon must, however, endeavour to satisfy his patient respecting this fallacy, and should it so happen that an instrument is required,

a smooth gum-elastic catheter of about No. 9 or 10 in size, with a properly fitting wire, is to be preferred, and should be introduced while the patient is in the recumbent posture. After an injury of this description, any active exertion should be avoided until the local effects of the mischief have wholly subsided, and every precaution should be taken to prevent the subsequent formation of stricture.

It is, however, to be borne in mind that very serious injury may be inflicted in this locality without the slightest attendant urinary disturbance. Thus, a healthy young man was brought to the hospital who had been labouring in a quarry. Some of the projecting bank fell on him and so crushed him that, amongst other comparatively minor injuries, his perinæum was absolutely rent throughout by coming in contact with a portion of projecting rock underneath him. The wound was jagged, deep, and partially contused, and its edges were widely separated. It extended obliquely from the right side of the scrotum to the verge of the anus, exposing the urethra and the front wall of the rectum, but giving no indication of any absolute wound of either canal. Here, notwithstanding the tedious and complicated reparative processes set up, not a symptom of urinary irritation worth noticing was complained of. After complete cicatrisation was effected, however, the introduction of a catheter was required to relieve some uneasiness in micturition, which soon afterwards subsided.

CASE IV.

*Laceration of the Urethra from a fall on the Perinæum.—
Effusion of Blood into the Perinæum and Scrotum.—
Hæmorrhage from the Urethra.—Retention of Urine.*

A young man, aged nineteen years, retired to bed, having passed his urine immediately beforehand. Shortly afterwards he was aroused by a storm, and apprehending that the sash of the window which was over his bed would be burst in, he stepped up in the dark on the top-railing of his bed to secure it, when he slipped and fell astride on the naked perinæum, striking it with great force against the iron rail. Unwilling to cause any disturbance he spent the night in great pain, felt a swelling quickly growing up in the perinæum and scrotum, and when light appeared found his shirt stained with blood which was oozing from the orifice of the urethra. He now for the first time had a desire to pass water, and failing after repeated efforts to do so, although he had the sensation as if the urine were escaping, he sought for assistance, when, the attempt at the introduction of a catheter not having been successful, I was sent for about eighteen or twenty hours after the occurrence of the accident. He was then in great agony, his countenance was pallid, his pulse feeble, and his whole aspect indicative of much suffering. The scrotum was of a dark blue, almost black colour, and presented the appearance of an enormous bag irregularly distended with blood, which from the feeling communicated on palpation

was partly fluid and partly coagulated. The fore part of the perinæum was also swollen, and the tumefaction in each situation was stated to have much increased since the efforts which he had made to pass water. The penis near its scrotal portion was nearly double its natural width, and bright blood trickled in considerable quantity from the orifice of the urethra. The finger introduced within the rectum detected a fulness which wholly concealed the outline of the bulbous and membranous portions of the urethra. The bladder was greatly distended, reaching almost to the umbilicus, and the young man was making incessant and fruitless expulsive efforts to pass water. I placed him in the recumbent posture, and without encountering any obstruction of importance, introduced a gum-elastic catheter of No. 8 size into the bladder. About a pint of healthy urine was drawn off, the first gush alone being tinged with blood; the catheter was secured in the bladder, the most perfect rest and quietness enjoined, and the usual antiphlogistic treatment adopted. The scrotum and perinæum were loosely supported, were constantly kept damped with the ordinary lead lotion, and the urine was not allowed to accumulate in the bladder in large quantity. I sent the man to hospital, and at the end of three weeks the enormous extravasations were wholly absorbed, and the healthy condition of the parts fully restored. There was no visible suppuration, and the patient left with his urethra perfect, and admitting of the introduction of No. 8 or No. 10 catheter. Four or five months afterwards he reported from a distant part

of the country, in which he resided, that he had perfectly recovered, and that he had followed the directions given him respecting the occasional introduction of a catheter as a protection against any subsequent mischief.

Fig. 2, Plate V., represents very accurately the appearances present at the seat of the injury, upon the second day after its occurrence.

CASE V.

Laceration of the Urethra from a fall on the Perinæum.—

Effusion of Blood into the Perinæum and Scrotum.—

Hæmorrhage from the Urethra.—Retention of Urine.—

Gangrene of the Scrotum.

The master of a collier, a man middle-aged and of a full and bloated appearance, whilst intoxicated at night fell astride on the edge of the hatchway of his ship. He was carried to bed, and next morning when he awoke found that in his attempt to make water none escaped, although he had the sensation of its passing along the urethra. Under these circumstances I saw him on board his vessel about twenty-four hours after the accident, and the symptoms indicative of a lacerated urethra were manifest. The penis was full and congested: the scrotum and perinæum greatly ecchymosed, tense, and enormously swollen; and blood was flowing from the orifice of the urethra. The man was not yet perfectly free from the effects of drink, and he was straining incessantly

and forcibly to empty his bladder, which could be felt largely distended. At the time there was no alternative but to relieve the retention of urine. A gum-elastic catheter was introduced, and a large quantity of urine drawn off—the first portion alone being tinged with blood. The instrument was secured in the ordinary way, the requisite treatment enjoined, and directions given to report the progress of the case. These directions were neglected; drunkenness was renewed, and when application was next made after the lapse of more than forty-eight hours, the greater part of the scrotum was found in a state of gangrene, and high fever had set in. There was then no retention of urine, as it flowed tolerably freely through the catheter, which fortunately had not been disturbed. The man was sent to hospital, a fresh catheter was adjusted, and the appropriate local and general treatment adopted. At the end of a fortnight he was obliged to join his ship, and notwithstanding very sharp fever and considerable local sloughing,* he escaped, cicatrization being far advanced, and the urethra being fairly pervious—no disposition to urinary fistula having then presented itself.

* As a promoter of healthy action in a sloughing condition of the scrotum, whether arising from injury or from disease, or connected with urinary affections or not, great benefit will often be derived from the local application of the compound tincture of benzoin. Indeed, in all parts similarly affected I have found this agent most beneficial. It excites healthy action, corrects fœtor, constitutes a light dressing, and can be accurately applied to the deepest and most irregular portions of the affected surface, by saturating small strips of lint or pieces of French wadding with it, diluted or not with tepid water, as may be suitable. In cases of anthrax no application is

Fig. 3, Plate V., gives a good representation of the local appearances in the progress of such a case.

It would be difficult to select cases better suited than the two preceding to illustrate the effects of injury to the perinæum implicating the tract of the urethra. They are by no means cases of common occurrence, and are given as extreme instances, in order that the contrast between the result of each may be well considered. In each there cannot be a question but that the urethra was lacerated; in each a somewhat similar line of treatment was adopted at the time of the accident; and in neither was there any difficulty experienced in the introduction of a catheter into the bladder. It is quite intelligible that in some cases the effects of injury to the urethra may be much more limited than in others, and may be wholly confined to the more fixed portions of that canal, where, in the great majority of instances, its laceration from violence takes place. The resulting swelling, moreover, may be obvious as in the above cases, or may be discover-

more useful. It should not, however, be continued when granulations are forming or formed, as it will then be found a most painful remedy, unless very largely diluted. The average strength of a drachm of the tincture to two ounces of water will be found to answer. I consider this application more manageable and more satisfactory than the "warm dressing" in ordinary use. In recent wounds, also, attended with capillary hæmorrhage, it succeeds admirably in arresting the bleeding and in encouraging healthy reparative action. An equally good effect is likewise often produced by its application in those formidable hæmorrhages attendant on special forms of phagedænic ulceration of the penis and other parts, whether lupoid or syphilitic in their nature.

able only by very careful manipulation, or from its deep situation may altogether elude detection. In all cases where the symptoms of laceration are unequivocal, and where the surgeon visits his patient immediately, or soon after the occurrence of the accident, and especially before any attempt has been made to pass urine, a gum-elastic catheter armed with a firm wire should be introduced into the bladder while the patient is recumbent and secured there, and every effort should be made to check the local mischief, as nature will often accomplish a great deal more even in the most aggravated cases, especially in the earlier periods of life, than could be anticipated. Should the surgeon, however, fail in the introduction of a catheter; he must, to accomplish that object, be guided by those principles which are laid down in all systematic works on the subject, recollecting that while neglect and undecided treatment will lead to fearful results, he should not be too precipitate in adopting summary measures. In the progress of such cases I have observed a symptom which may deceive and lead to great mischief, if the surgeon be not on his guard. I allude to an emphysematous condition of the ecchymosed swelling, either in the perinæum or in the scrotum, or in both situations. I have found it in extravasations of blood in this locality, apart altogether from any ostensible urethral complication, as for example in particular forms of traumatic hæmatocele. It is a symptom which grows imperceptibly; it is not usually discernible for twenty-four or thirty-six hours after the injury which may have produced it has been in-

flicted, or it may occur much earlier or later, in fact during any stage of the reparative processes set up. It continues for some days, is often accompanied with considerable pain, and then gradually passes off.

A case occurred in the Richmond Hospital, where this symptom was most characteristically marked in the upper and inner part of the thigh, and in the scrotum, perinæum, and penis of an aged man over whom a heavily-laden cart had passed, producing extensive contusion in these situations, with the additional serious complication of a comminuted and compound fracture of both bones of the leg. Here much difficulty of diagnosis presented itself, from the constitutional and local symptoms attendant on the fracture, and from the general tumefaction of the limb; but the features of the constitutional symptoms, the natural temperature of the ecchymosed parts, their healthy consistence, and the obvious vitality of the integuments around, notwithstanding their altered colour, tended to confirm the opinion as to the character of the emphysema, which gradually disappeared without any special treatment. It is of much importance to be aware of the harmless nature of this occasional attendant on extravasations of blood, and particularly in cases such as those which have been detailed, where the necessity for caution cannot be exaggerated, as it will prevent interference on the part of the surgeon which may be productive of the worst results.

CASE VI.

Laceration of the Penis and of the Urethra.—Copious Effusion of Blood.—Retention of Urine.

A man aged about thirty years, and of rather full habit, had some dispute with a prostitute in a brothel, when she seized his penis whilst in a state of erection, and gave it a sharp twist. He suffered very great pain at the time, and after about eight hours, being attacked with agonizing retention of urine, applied to me for assistance. He had congenital phymosis; the portion of glans penis visible at the orifice of the prepuce was dark and congested; the integument of the penis and scrotum ecchymosed; and the organ itself was irregularly swollen, especially in front of the scrotum, where a remarkable fulness was observed, and where laceration of the corpora cavernosa obviously existed. The areolar tissue of the scrotum was not involved to any extent in the swelling; the outline of the testicles was perfect, but the natural angle between the penis and the scrotum was nearly effaced, in fact almost reversed, so that the organ had a sort of fixed inclination upwards. There was, moreover, much increase in its transverse width in this particular situation, and the course of the urethra was obscured. Considerable hæmorrhage had taken place from the urethra at the time of the injury, so much so that in addition to the pain he endured, great prostration was produced. The bleeding continued, some incontinence of urine accompanied it, and the

retention was extreme and paroxysmal, the bladder forming a prominent tumour in the hypogastrium. I gently passed into the bladder a straight, medium-sized gum-elastic catheter without a stilette, and, drawing off a large quantity of urine merely stained with blood in its first portion, directed the instrument to be retained. Moderate pressure was made around the swollen and injured portion of the penis, with strips of lint wetted with the ordinary lead lotion, and tartar emetic and opium were ordered. The hæmorrhage from the urethra gradually subsided; the catheter, having produced some uneasiness, was removed after about forty-eight hours, and was subsequently only occasionally introduced during the progress of cure; and after ten or twelve days, by the aid of rest, low diet, and ordinary medical treatment, recovery was far advanced. The man was then obliged to leave the hospital, the integuments of the penis and scrotum being yet largely ecchymosed, and the body of the former irregularly hardened and swollen in the immediate seat of the injury.

Fig. 4, Plate V., illustrates the appearances in the earlier stages of the injury.

Injuries similar to that noted in the foregoing case, and occurring when the penis is in a state of rigid congestion, must be considered serious. It is not always easy to ascertain the exact nature of such cases, and immediate application is not made to the surgeon unless some very formidable symptom pre-

sents itself. The appearance of the organ is often alarming, and the amount of blood extravasated from the laceration of the corpora cavernosa is very considerable, producing not only much tension but likewise great deformity. The hæmorrhage from the urethra is very great in some cases; but I have not seen it absolutely injurious, and I am rather disposed to the opinion that it should not be too suddenly arrested. I have known sexual intercourse during an attack of acute gonorrhœa to be followed by this special lesion of the urethra and penis; but the most serious cases of all are those in which from previous phagedænic or other ulceration, some distortion of the penis in front of the scrotum has existed, and in which forcible intercourse has been subsequently attempted. I believe that in many such cases there is an absolute rupture through one or both of the corpora cavernosa. Here the organ must be properly adjusted, and the most careful watching observed. The presence of a gum-elastic catheter in the bladder is of the first importance. The instrument should fit rather fully, and when the urine begins to escape along its outer surface a larger one may be substituted, or perhaps its use altogether dispensed with. It is unnecessary to add that the strictest and most rigid general treatment and absolute rest of the organ must be enforced.

CASE VII.

*Wounds of the Penis.—Complete Section of the Urethra.—
Partial Retention of Urine.—Antescrotal Fistula.*

A smith of middle age, whilst working at a kitchen range, slipped, and struck with violence the under part of the penis in front of the scrotum against the sharp edging of one of the doors of the range. A deep transverse wound through the integuments was the result, and considerable hæmorrhage having occurred the man applied at hospital. On examination it was found that, in addition, the urethra was completely severed, and the body of the penis exposed on each side. The edges of the wound gaped widely, and the vesical end of the divided urethra had retracted so much, that it could not by any expedient be discovered, to allow a catheter to be passed into the bladder. There was a desire to pass water but no painful retention. The edges of the wound were gently approximated, and light compresses applied. The urine in some hours after the accident flowed through the wound, and continued to do so throughout its healing. This took place very slowly and without much surrounding inflammation, a fistulous opening ultimately remaining, through which the urine occasionally escaped involuntarily, but usually discharged itself at irregular intervals with an expulsive effort, none passing through the forepart of the urethra. The man was not amenable to directions given him, became reconciled to his condition, and left the hospital at the

time at which remedial measures were being contemplated.

Wounds of the urethra, such as the above, the result of injuries either intentionally or accidentally inflicted on the penis, are not commonly met with, and when they are situated immediately in front of or behind the scrotum, great difficulty is encountered by the surgeon in their management. Notwithstanding the comparatively superficial position of the canal in these situations, if its section be complete, especially in front of the scrotum, a retraction and contraction of the proximal portion take place to an extent which renders it almost impossible to discover it, and the surrounding areolar tissue being injected with recently extravasated blood, this difficulty is in no small degree increased. A catheter can easily be passed through the forepart of the urethra to the wound, if that canal have been only partially divided, and the bladder may thus be reached; but when the section of the urethra is complete, and the edges of the wound in it are widely separated, the surgeon may altogether fail in accomplishing his object. Under any circumstances it is prudent not to be too particular in accurately closing the wound in the integuments, as troublesome extravasation of urine may take place; and hence it might be preferable to defer ulterior proceedings until the local effects of the injury have become fully limited by the supervening inflammation, and thus the exact situation of the distal orifice of the proximal

portion of the urethra be more likely to be found. Should retention of urine occur, a very important question will arise as to the mode of operative procedure which it may be proper to adopt in the case above noted. Incontinence of urine is more likely to occur in the earlier stages of this description of injury, and in the later the healthy functions of the bladder are often not materially interfered with. It is difficult to decide upon that treatment which may be most suitable, as it must be influenced by the special case. Every effort, however, should be made to secure the integrity of the urethra by the introduction of a catheter into the bladder. Ante-scrotal fistulæ from disease are very unmanageable, but are often still more perplexing when they are the result of injury.

CASE VIII.

Fracture of the Pelvis.—Laceration of the Bladder.—Retention of Urine.—Sudden fatal Termination.

A fine boy, aged seven years, whilst playing in the streets, was thrown down by a heavily-laden grocer's van, the wheels of which were stated to have passed over him. When raised he was unable to stand, and was quickly carried to the Richmond Hospital. He was then in a state of slight collapse, but no marks of violence being visible his friends removed him to his home, after an hour or so. The accident occurred about six o'clock in the evening, and at ten o'clock the next morning the boy was brought back to hospital, his mother stating that since the accident he was

unable to leave his bed, that the slightest movement of his body appeared to give him much pain, and that he could not pass water. I examined him carefully: no contusion or other injury of any moment was traceable on the surface of the trunk or extremities, and no fracture or dislocation could be detected. There was no hæmorrhage from the urethra; the desire to pass water only came on within the last few hours, and the outline of a distended bladder was now clearly marked. Sensation and the motor power of the extremities were perfect; yet the child could neither sit nor stand, and the slightest change in the position of the lower limbs gave great pain. The general symptoms present indicated much prostration, the countenance being pallid and contracted, the surface of the body cold, and the pulse very feeble and flickering. It was now remarked that there was extreme difficulty in placing the boy in a favourable position for the introduction of a catheter, and that it required a careful adjustment of the pelvis to reach the bladder, from some interruption in the distant part of the urethra—that a disarrangement existed which was set to rights by some accidental movement of the pelvis; yet there was no crepitus or other symptom of fracture discernible. It should, however, be remarked that the boy was absolutely intolerant of any satisfactory examination. Less than half a pint of healthy-looking urine was removed, and at every subsequent introduction of the catheter the same caution was required to ensure the easy entrance of the instrument into the bladder. I drew off the

urine morning and evening. No trace of blood was to be seen in it or in its deposit, and only under the microscope could I detect a slight evidence of its presence. On the sixth day the bladder acted voluntarily, and also on the seventh, on the evening of which symptoms of prostration suddenly set in, accompanied with great irritability of the stomach and hypogastric pains, and when I reached the hospital next morning the poor boy was moribund. Throughout his illness his intellect was clear, and his sole wish was to be left quiet in the position in which he happened to lie, which was usually on his back with the lower limbs partially flexed. He never had any marked symptoms of peritonitis or other abdominal distress but that specified, and his bowels acted under the use of mild enemata.

A post-mortem examination was made with great care. No external mark of injury was visible on the body, with the exception of a slight patch of ecchymosis on the right side of the perinæum in the direction of the ascending ramus of the ischium, and a few patches of contusion on the thighs and legs. Within the cavity of the peritoneum there were no traces of inflammation, nor was there any effusion either of urine or of blood. In the situation of the sacro-iliac synchondrosis, on the right side, blood was extravasated behind the peritoneum, and the same condition existed in front of it, behind and amongst the abdominal muscles on each side of the symphysis pubis. The bladder was partially distended, and the cellular tissue surrounding it, coloured with blood, was unnatu-

rally dense over the right anterior and lateral aspects of the organ, where the several strata of connective tissue were closely matted together. The pelvis and bladder were removed as carefully as possible, and now an amount of injury was detected, which, from the symptoms present during life, could scarcely have been expected. Numerous fractures were found in the pelvis, the exact displacement resulting from which at the time of the accident can only be surmised, but from their situation, direction, and extent it was obvious that the crush must have forced the sides of the pelvis together, and implicated the bladder in the injury. Thus, upon the right side there existed a comminuted fracture of the horizontal branch of the pubes, and the ramus of the ischium close to the tuberosity was also broken; the transverse process of the first bone of the sacrum was broken close to the sacro-iliac synchondrosis, and another fracture traversed the third bone of the sacrum near the same articulation. On the left side, the horizontal branch of the pubes was broken near its centre, and also the ramus of the ischium in a situation corresponding to the fracture noticed upon the opposite side. In Plate VI., Figs. 1 and 2, an accurate representation is given of the situations of these several fractures; and Fig. 3 shows a perforating wound caused by one of the fractures in the right side of the bladder, in that portion of it destitute of peritoneal covering, whilst on the side directly opposite is seen a laceration of the mucous and muscular coats of the organ. Every condition tending to a favourable result was visible, the



FIG 2.



MR. FLEMING

ON FRACTURES OF THE PELVIS, WITH INJURY TO THE BLADDER
AND THE URETHRA.

EXPLANATION OF PLATE VI.

Figs. 1 and 2 exhibit the front and lateral aspects of the pelvis, with the several outlines of the fractures specified. Case VIII.

Fig. 3. A vertical section through the anterior wall of the bladder shows the situation and extent of the wounds described in the text—the penetrating wound being on the right side, and corresponding with the over-lapping fracture through the body of the pubis on the same side. The anatomical relations of the bladder in the child will, in some measure, account for the position of those wounds. Case VIII.

reparative inflammatory processes being limited, and presenting no evidence of a suppurating or sloughing character.

The pelvis and bladder are preserved in the museum of the Richmond Hospital.

In a case of injury of the pelvis complicated as the above, it is quite intelligible that a portion or portions of the comminuted fragments of bone might at the time of the accident enter the bladder, through its wound, or that ultimately such results might arise in the reparative processes set up from detached portions of necrosed fragments escaping into that viscus, and giving rise to the symptoms of stone. Such a case occurred in the practice of the late Mr. Cusack of this city, very many years back. A large flattened portion of a leaden bullet, partially encrusted with urinary concretion and impacted in a thick scale of bone, was successfully removed from the bladder by the lateral operation of lithotomy, two similar operations having been previously performed by surgeons of the first eminence in England, without finding the foreign body. I assisted at this operation, and the details of the case were often noted in clinical remarks. The specimen is at present in the museum of Steevens' Hospital. The subject of the injury was son of the most eminent physician in Dublin at the time, and the recovery of the young gentleman was complete.

In the museum of the College of Surgeons are a

gun bullet, a slug, some pieces of cloth and earthy particles which were removed by the late Mr. Colles from the bladder of a gentleman.

CASE IX.

Fracture of the Pelvis.—Laceration of the Urethra.—Ecchymosis of the Penis and Scrotum.—Hæmorrhage from the Urethra.—Retention of Urine.

A man between 45 and 50 years of age, and of delicate frame, whilst employed in the sewerage of one of the public streets was crushed under a bank of clay which had fallen in, and was carried to the hospital in a state of extreme collapse. When placed in bed, in addition to other superficial injuries it was found that the integuments of the penis, the scrotum, and perinæum were enormously swollen and discoloured from extravasated blood, the appearances of the two latter being much as represented in Plate V., Fig. 2. The region of the bladder was full and tense, and on each side of it there were tenderness and abnormal fulness. The inguinal canals were also swollen and partially ecchymosed. The man was evidently sinking rapidly from general collapse combined with symptoms of internal hæmorrhage. He was in a state of incessant restlessness; his intellect was clear; his chief complaint was that of a great desire to pass water with an inability to do so; semi-fluid blood trickled from the urethra, and pressure along the perinæum increased its flow. A gum-elastic catheter was passed, and reached to

about the region of the bulb, when a gush of what appeared to be bloody urine escaped through it, the patient getting immediate relief. The instrument did not, however, enter the bladder, nor could that object be attained by any expedient even with a metallic instrument. Fatal collapse quickly followed, and on examination after death it was discovered that the urethra was completely torn across near the junction of its membranous and prostatic portions, and that an enormous pouch was formed into which the catheter had entered, this pouch communicating with the perinæum and scrotum in front, and with the forepart of the rectum and the base of the bladder posteriorly. Behind the abdominal muscles, in the supra-pubic region, a vast sheet of blood having a urinous odour existed; the inguinal canals were also infiltrated with a similar fluid, and under the arch of the pubes it was traceable along the dorsum of the penis. There was a fracture of the body of each pubes, and of the ramus of each pubes and ischium, near the situation of the original lines of junction; and the anterior connexions of the bladder were torn through. It was uninjured and lay partially flaccid and surrounded by blood, the urine contained in it being free from any tinge of blood.

The pelvis is preserved in the museum of the Richmond Hospital.

The subject of fractures of the pelvis, particularly in connexion with wounds of the urethra and bladder, is one of great importance, and the selection of the

above cases will it is hoped tend to elucidate it. That the urethra should be rent across, or that the bladder should be torn from it, is not surprising when we consider the nature of many of these injuries, and the great amount of violence which produces them. In contusions of the perinæum and falls from horseback, in railroad or such class of accidents, it is quite intelligible how severe must be the mischief done to the softer textures in the vicinity of these fractures. I have seen the triangular ligament of the urethra extensively lacerated, and the areolar tissue around injected with extravasated blood and urine, which, from the injury done to the fasciæ, could be traced along the dorsum of the penis, and above the pubes. The crura of the penis at their origin are also liable to be implicated in these fractures. It is an admitted fact that the attendant general symptoms are very equivocal, and hence they always require careful investigation. What can be more instructive to the surgeon than the case of the little boy which has been detailed at page 39? Who could have imagined, from the symptoms present, the extent of injury done in that case to the pelvis or the bladder? Not a trace of contusion of any importance was visible externally to indicate the former, and no hæmaturia to lead to the suspicion of the latter. The details might perhaps induce some to suppose that the signs and symptoms of the injury had not been duly investigated; but a somewhat parallel case occurs to me as being recorded:—A boy was crushed between the wheel of a dray and a wall; he afterwards walked to

a hospital, and did not appear to have suffered any serious injury; he sat up in the dispensing room without visible discomfort, and yet, symptoms of fatal collapse having suddenly supervened, the "pelvis was found, after death, comminuted on both sides above the thyroid foramina, and fragments of bone were lying between the body of the pubes on each side and the bladder; fractures also passed through the tuberosities of the ischia, and both sacro-iliac synchondroses were lacerated anteriorly."

The following case affords an additional proof of the obscure nature of these injuries.

CASE X.

Fracture of the Pelvis without appreciable rational Symptoms.

A gentleman much advanced in years was stepping up a ladder to get on a hay-loft about twelve feet from the ground, when, having nearly reached the requisite height, and finding that the ladder was slipping from under him, he attempted to throw himself forward into the loft above, and struck his pubes forcibly against the sill of the door-way. In this effort he lost his balance and fell back on the ladder, which was now sliding down along the wall against which it had been resting. He was taken up in a state of partial insensibility, but on examination no serious local injury could be detected. He was confined to his bed for more than six weeks, but was able during that time to assist himself, and could even walk slowly about his

room without experiencing much suffering or requiring much support. He could turn as he pleased in bed, and had tolerably free motion of his limbs, passed his urine and fæces without much annoyance, and ultimately renewed his active habits in about two months after the occurrence of the accident. In the progress of cure considerable ecchymosis was visible about the groin and pubes, particularly on the right side, but further than an uncomfortable feeling of stiffness in walking or in moving the lower extremities, he did not suffer. After a time he accidentally discovered a bony ridge projecting into the perinæum on the right side, and unequivocal evidence of an overlapping angular fracture was found at the seat of junction of the descending ramus of the pubes with that of the ascending ramus of the ischium, where perfect osseous union appeared to be effected. There were also about the body of the pubes on the same side a fulness and a bony hardness not to be traced on the opposite side.

Great circumspection is required on the part of the surgeon in the investigation of injuries such as those I have been describing, as the contents of the pelvis are often implicated in them. He will find that his treatment must generally be expectant, and that in cases of an apparently simple character fatal results will unexpectedly arise, important structural lesions having occurred which were not indicated by the presence of any special symptoms at the time of the accident, whilst other cases accompanied by

most formidable symptoms will take a favourable turn. There is a pelvis in the museum of the Richmond Hospital, which was removed from a man who received one of those crushing injuries six or seven years previously to the occurrence of the accident which caused his death. All the symptoms of fracture of the pelvis, with laceration of the urethra, were then manifest, and extensive urinary extravasations accompanied them, requiring numerous deep incisions in the perinæum. After a protracted illness of months in Steevens' Hospital, the fistulous openings resulting from the accident healed, and the man left, the canal of the urethra having been restored and the bladder acting without much annoyance. This man fell from a high scaffolding and was carried to the Richmond Hospital, moribund from fracture through the base of the skull. His pelvis exhibits the characters of previous fractures through the body of each pubes and through the corresponding rami of the ischia and pubes with the most perfect osseous consolidation of all the fractures.

Although my present observations have been especially directed to those fractures of the pubes and ischia in which the bladder and the urethra are so likely to be involved, yet fractures or injuries of other portions of the pelvis are not to be lost sight of by the surgeon, as special important lesions may complicate them also.

Hence the following cases will possess some practical interest.

CASE XI.

Fracture through the Acetabulum.—Extensive Ecchymosis around the Pelvis.—Hæmorrhage from the Rectum.

A gentleman of middle age and full habit had just crossed one of our bridges on horseback, when, reining up his horse rather roughly, the animal reared and fell back upon his rider. He was unseated, but holding on by the reins, and endeavouring to extricate himself he was again and again crushed under the horse. He did not, however, lose his consciousness, and had himself placed in a cab and brought home, where I saw him shortly after the accident. The amount and extent of ecchymosis present over the whole of the pelvis, reaching even to the lumbar region, exceeded any I had ever seen, and amongst other serious injuries which he sustained, a fracture through the left acetabulum is here specially deserving of note. The symptoms of this fracture were tolerably conclusive, and a sensation in the rectum, producing the most painful tenesmus, was particularly distressing. On the second day after the occurrence of the injury, a more minute examination of the hip-joint was deemed expedient, when a frightful hæmorrhage from the rectum suddenly supervened, was more or less persistent for forty-eight hours, and was ultimately only controlled by the most active local and general remedies. This hæmorrhage, which was of a bright arterial character, was, I feel satisfied, the result of some intestinal lesion connected with the

fracture, and was induced by the necessary examination.

It will be easily understood that a complication such as intestinal hæmorrhage may attend on fractures of the pelvis. Indeed the records of surgery tend to confirm such an opinion, and amongst them no case immediately occurs to my recollection more apposite than that recorded of The Wandering Piper, who met with an injury of this class in an aggravated form. He died of phthisis in one of our hospitals at a period long subsequent to the occurrence of the accident, when, on a post-mortem examination, a portion of intestine was found intimately impacted in the line of the fracture of the pelvis, in which situation it seemed to have been caught and retained by the broken fragments at the time of the accident.

The accidents which produce such injuries are of the same severe character as in the cases already detailed, and fractures may or may not accompany them; they may happen in children or in advanced life, and may be associated or not with urethral or vesical injury. I can bring distinctly to my recollection two instances in children between four and six years of age of separation of the pubes at the symphysis. One was that of a girl, the other that of a boy, and each child had been run over by a car. In each case there was retention of urine, with some slight hæmaturia. The only lesions discernible were a large patch of ecchymosis over the pubes, forming a very prominent swelling, and a distinct separation of

the bones at the symphysis to such an extent as to admit of much motion between them. In addition, there was pain on the slightest movement of the pelvis, with loss of the ordinary motor power of the lower extremities, or perhaps, more properly speaking, with an indisposition to move them from apprehension of pain. In the case of the little girl, it may be remarked that there was laceration of one of the labia. Each child was removed from the hospital after a month apparently perfectly recovered, rest in the horizontal posture and the application of a pelvic bandage being the principal remedial agents adopted. The retention of urine did not, after the first day of the injury, require the use of the catheter.

The following case of this class of injury may be noted.

CASE XII.

Injury of the Pelvis.—Separation of the Ossa Pubis at the Symphysis.—Extensive Ecchymosis over the Pubes, in the Scrotum, and in the Perineum, accompanied with local signs of Emphysema.

A little boy, aged two years, was crossing a roadway, when he came in contact with a dray and was thrown down. It was stated that one of the wheels passed over him, but his exact position at the time of the accident could not be ascertained. He got up, attempted to run and immediately fell, when he was carried to the hospital. No injury of the extremities could be detected, neither was there any injury of the

trunk discernible. Next day the child was again brought to the hospital, when considerable ecchymosis over the pubes into the scrotum and the perinæum attracted attention. The accompanying swelling was very remarkable and prominent, especially over the site of the symphysis of the pubes. He passed water with pain and with much difficulty, and it was free from any stain of blood. His bowels had also been spontaneously freed since the accident. He now lay heavy and listless in his mother's arms, had much fever, and could not tolerate the slightest movement of the pelvis or lower limbs. The tenderness over the pubes was extreme for some days, and in proportion to its subsidence and that of the ecchymosis, a distinct sulcus or inter-space, with unnatural mobility, was traceable in the site of the symphysis. About this period also a remarkable crepitating feel over the seat of the extravasated blood was communicated to the fingers on pressure of the integuments around. This condition quickly subsided with the other symptoms, by rest and the ordinary antiphlogistic treatment. A pelvic bandage was subsequently applied, and after a fortnight the boy could not be prevented from moving about the ward, but it was yet obvious that his gait was shuffling and unsteady. Within a month, however, he had perfectly recovered from the accident and was brought home.

Perhaps the most instructive features connected with this case are, the extreme youth of the child, the

presence of the peculiar emphysematous crepitation to which attention has been elsewhere directed,* and the rapidity with which the effects of the accident passed off.

In the adult, the symptoms of such injury are to a certain extent equivocal, yet attention to details will enable the surgeon to form a tolerably accurate estimate of them. In the following case the displacement of the bones of the pelvis occurred at the symphysis pubis, and at the left sacro-iliac synchondrosis.

* This peculiar phenomenon attendant on ecchymosed swellings, the results of injury, has presented itself to me in very many instances. I have found it under the scalp, on the trunk, over the several cavities, around the larger joints, over the region of the sacrum, and in the extremities. The crepitus is sometimes very fine, so fine that it may escape superficial examination, is quickly obliterated by pressure, and again equally quickly returns. It is similar to that delicate stethoscopic crepitus present in special fractures of the ribs, associated with hæmoptysis, and perhaps produced by traumatic ecchymosis of the lung; or it resembles the very minute crepitation attendant on certain forms of pneumonia or of œdema of the lung. I do not question that this crepitating feel may be the local evidence of gas in the areolar tissue, and I admit that the gas may be secreted or generated in that tissue; but, on reflecting upon the presence of this phenomenon in ecchymosed swellings, it appears to me that the changes which the blood undergoes when it is extravasated through areolar tissue may, perhaps, account for it. I think, under such circumstances, that the blood is more or less quickly resolved into its rougher elementary constituents; that the walls of some of the spaces of the areolar tissue which contains those constituents, such as the serum and crassamentum, become as if glazed with their fibrinous element, in shape of plastic effusion; that other spaces completely filled with this will be partially obliterated, whilst again, in other portions, compartments will exist, which contain in addition, in greater or less quantity, the crassamentory element intermixed with serum; and that when the whole swelling thus constituted is subjected to pressure, the physical sign alluded to is produced, though doubtless some chemical changes in the extravasated fluid, or a certain amount of local inflammatory action, may have also a share in its production.

CASE XIII.

Separation of the Bones of the Pelvis at the Symphysis Pubis, and at the left Sacro-iliac Synchondrosis.—Hæmorrhage from the Urethra.—Retention of Urine.

A countryman, about twenty years of age, was assisting in pitching up hay on a large rick, and was the uppermost man, with his back to the rick, on a ladder used on such occasions, when, in the act of throwing up the hay, by some awkward movement he lost his footing and fell on the pavement below, from a height of twelve or fourteen feet. According to the account given he fell obliquely, striking his left buttock in particular against the ground. He was crippled up and was unable to move, was carried home, and next day brought to the hospital in a cart. He had not passed water since the accident; he said he had some bleeding from the urethra, and complained of great tenderness and uneasiness about the left hip and the corresponding thigh and leg. He had also general febrile disturbance. On placing him in bed my first impression was that the left femur was fractured in some portion of its upper end, when, whilst endeavouring to adjust the pelvis for accurate measurement of the limbs, the unnatural mobility of the left os innominatum attracted attention. There were tenderness and considerable ecchymosis in the region of the pubes, and also over the tuberosity of the left ischium and corresponding side of the sacrum, but there was no crepitus, nor any defect of moment in the general movements of the thigh on the pelvis. When

lying steadily recumbent on his back he was free from uneasiness, but was intolerant of any disturbance of the pelvis. A yielding of the os innominatum on the left side, in the antero-posterior direction, was perceptible when pressure was made on the front of the bone, whilst pressure on the tuberosity of the ischium caused it to move in the vertical direction. At the symphysis there was much effusion of blood, with a decided irregularity and separation of the bones of the pubes; but there was so much pain on pressure that an accurate examination was impossible. The bladder was relieved, and as much steadiness of the pelvis was secured as could be accomplished with ease to the patient. The urine was free from blood. About the third day from the occurrence of the accident, the integuments covering the left iliac and gluteal regions were very extensively ecchymosed. This condition, however, with the attendant fever, gradually subsided, the bladder quickly recovered its functions, the bowels acted satisfactorily, and after two months' confinement with a pelvic bandage, and with the limb adjusted in the extended position as for fractured thigh, the man was removed from the hospital with every prospect of complete recovery, he being at the time enabled to go about on crutches. With their assistance he could then move with tolerable freedom, no appreciable displacement of the left side of the pelvis being traceable, nor any alteration in the position or direction of the limbs being perceptible.

The opportunity afforded for ascertaining the effects of the absolute injury inflicted in the following

case renders it worthy of record; and this is, perhaps, the more desirable, as the causes of such mischief are now comparatively unfrequent.

CASE XIV.

Forcible Separation of the Bones of the Pelvis at the Symphysis Pubis, with partial Disjunction at both Sacro-iliac Synchrondroses.—Vertical Fissure through the Body of the Sacrum.—Laceration of the Bladder and of the Urethra.

A labouring man, beyond sixty years of age, was employed in undermining one of the side-walls of a house, when it gave way and he was crushed beneath it. He was with much difficulty removed from under the rubbish, and was brought to the hospital some hours afterwards, sick and faint, groaning with agony and totally powerless. When undressed, extensive ecchymosis was visible over the regions of the pubes and sacrum; blood was flowing from the urethra, and was effused under the integuments of the penis and scrotum, and distended the left inguinal canal, so as to resemble a hernia in that situation. Even the slightest movement of the lower limbs gave pain, but the principal suffering was referred to the region of the bladder, and to the symphysis of the pubes, in the latter of which situations the tenderness was so extreme that the gentlest pressure could not be borne. The symmetrical relations of the pelvis and the lower extremities were, as far as could be ascertained, unimpaired, and their motor powers and tactile sensations

were tolerably perfect. The immediate treatment had reference chiefly to the state of collapse present and to the allaying of pain. Subsequently it became necessary to relieve retention by the introduction of a catheter, which gave exit to about four ounces of urine perfectly free from any tinge of blood. The lower region of the abdomen gradually became swollen and tympanitic, the ecchymosis increased in extent, and crepitation was traceable under the surrounding integuments. Any attempt to change the poor man from the horizontal posture on his back produced agonizing pain. Reaction was never restored; his restlessness increased; and he sank with all the symptoms of internal hæmorrhage in about forty-eight hours after the accident. A post-mortem examination was obtained with much difficulty, when the ecchymosis, tympanitis, and emphysema were found to occupy the hypogastric, the iliac, and the inguinal regions, and to extend to the left inguinal canal. On the left side of the symphysis pubis a distinct projection was felt, the points of the fingers sinking into a hollow along its inner margin. The walls of the abdomen being perforated in the hypogastrium, a quantity of air devoid of any foetid odour escaped, and now, its cavity being opened, the spaces intervening between the walls and the peritoneum in that region were found to be largely infiltrated with blood. This was also traceable between the muscles, especially near the symphysis pubis, and was continuous with that effused into the left inguinal canal and into the cavity of the pelvis. There was a distinct separation of the bones of the

pelvis at the symphysis pubis, the left horizontal ramus being on a plain considerably above and behind that of the right, and a thin scale of bone being detached from it—firmly adherent to the intervening fibrous structure. There was a deep sulcus stained with blood between the true ligaments of the bladder, and on tracing the anterior wall of that viscus a vertical rent was found in it, about a quarter of an inch in extent, anterior to the reflexion of its peritoneal coat; the edges of the rent lying so closely applied to each other, that it was only discoverable by the escape of bubbles of air from within the cavity of the bladder when it was compressed. The bladder contained from two to three ounces of urine, untinged with blood; but around it and towards the rectum there was a great amount of blood effused external to the peritoneum. The ecchymosed and lacerated state of the perinæum and scrotum rendered it utterly impossible to insulate the urethra, it being apparently torn across in its membranous portion. On proceeding to remove the pelvis, the additional lesion of a partial separation of its bones was found at each sacro-iliac sychondrosis, and also a vertical fissure extending through the right side of the body of the sacrum. The bladder and the pelvis were removed, and in the accompanying figure, the separation at the symphysis pubis, the disarrangement of its bones and its arch, the disjunction at the sacro-iliac articulations, and the fracture in the sacrum alluded to are each distinctly shown. The occurrence of retention of urine and of the wound in the bladder, without the presence of

hæmaturia, are not the least interesting features connected with the case; the latter of which may perhaps admit of explanation on anatomical grounds, from the peculiarity of distribution of the arterial supply to that viscus. There was no trace of inflammatory action in the peritoneum or elsewhere.



FIG. 1.—Fracture of the Sacrum, with separation of the articulations.

With reference to injuries of the pelvis in general, it may be remarked that the diagnosis of the special lesions which its several parts may have suffered is frequently involved in obscurity, and that the attempt at too accurate an adjustment of their attendant displacements is often very questionable. As in certain cases of fractures of the ribs, mechanical compression of the thorax cannot be tolerated, so likewise in fractures or other injuries of the pelvis, the agony resulting from the adoption of any constrained provision for adjustment is frequently extreme, and

its advantages are very questionable. In such cases, I believe that if attention be paid to the proper position of the pelvis, measured by its symmetrical relations to the lower extremities, all that is desirable in local treatment will be accomplished. Too much anxiety to detect the crepitus of fractures, or to remedy any accompanying deformity, may be followed by consequences of a fatal character—such as uncontrollable hæmorrhage, or additional injury to the viscera contained within its cavity. A certain amount of deformity must be submitted to. It is unnecessary to particularise further, as the cases recorded will, it is hoped, be found sufficiently explanatory. They tend to illustrate the different effects of violence applied to the bladder and the urethra in those injuries, the obstructions which the current of the urine through the latter may or may not have to experience, and the modes whereby relief may be afforded. Whether the effects be merely contusion, or fractures, or displacement of the bones, accompanied or not by laceration of important organs, they severally demand the greatest caution in treatment. Attention to symptoms will teach the surgeon the impropriety of unnecessary operative interference in one class of cases, and the great value of promptness of action in another. An urgent desire to pass water is often among the immediate symptoms attendant on the more severe of those accidents involving the bladder or urethra, and hence the very great hazard attending them. In many such cases, however, the areolar tissue surrounding the seat of the lesion becomes almost in-

stantaneously injected with blood, and a protection is, as it were, given to that tissue. The relations of it to the rent in the bladder or the urethra are, moreover, altered, and so the injurious effects of the urine which may happen to have been extravasated are materially modified. The satisfactory issue of the case noted at page 27, in which, undoubtedly, urine had escaped through the torn urethra, is by no means unusual, and that of the torn bladder, detailed at page 45, is most instructive. It is important to bear in mind the possible complication of laceration of the urethra or of the bladder with such injuries, and the deceptive characters of the accompanying symptoms. The most accurate diagnosis, both absolute and differential, is required, whereby the surgeon will be prepared for the perplexing contingencies which he may have to contend with. In many of the periodicals, past and present, complicated cases of that class are recorded on unquestionable authority, in which favourable results have ensued which never could have been calculated upon. The extensive extravasations of blood so often present, the varied periods at which such extravasations may manifest themselves, and the occasional peculiarities which may accompany them, are valuable practical considerations for the surgeon, and are well deserving his attentive investigation.

I will conclude this subject with a summary of the two following cases, which have recently occurred, and I venture to do so, although they are somewhat misplaced, from the impression on my mind that

details of the symptoms attendant on surgical cases, in particular, are often more practically instructive than many general remarks which might be added to them. In the history of these cases, the questionable value of hæmaturia as an unerring evidence of any serious lesion of the bladder in injuries of the pelvis must suggest itself.

CASE XV.

Fracture of the Ilium.—Extensive Ecchymosis.—Retention of Urine.—Hæmaturia.—Death from Variola.—Outline of Fracture.—Integrity of Bladder.

A middle-aged countryman was severely crushed over the right side of the pelvis, between the wheel of his dray and an adjoining wall. He became immediately helpless, was unable to stand, and was carried to hospital some short time after, complaining of violent pain in the seat of the injury. The marks of extensive extravasations of blood were visible over the right side of the pelvis, and over the corresponding glutæal and trochanteric regions. The presence of a fracture through the ala of the ilium, about an inch or so below its crest, was here easily discernible, and crepitus was rendered easily distinguishable by alternate movements, communicated by the pressure of one hand over the crest of the ilium, and of the other over its anterior superior spinous process. Considerable irregularity was also traceable along the line of fracture in the corresponding iliac region. The ordinary additional symptoms of pain on any

attempt of motion of the pelvis or of the corresponding hip-joint, were also present. The usual appliances for fixity of position on the back in the recumbent posture were had recourse to, and the suitable general treatment was adopted. In the course of the night subsequent to the accident, the man was seized with painful retention of urine, when, insisting upon leaving his bed, he succeeded in emptying his bladder. The urine was highly coloured with blood, presenting much the appearance presented in Plate I. Fig. 5. Its colour was a brightish red, and it deposited a thin dark stratum of the same hue, the supernatant fluid retaining a faint tinge of it. This hæmaturia continued for the following day when it gradually disappeared, retaining throughout the peculiarity of increasing intensity of the blood-colour towards the end of each act of micturition. There was no appreciable irritability of the bladder, and the temporary retention was decidedly referrible to the unusual and constrained position in which the man was obliged to lie. Whilst progressing most favourably, he was attacked with variola, which terminated fatally about five weeks after the date of the original accident. The injured half of the pelvis having been removed, the outlines of the fracture through the ala of the right ilium, somewhat parallel with its crest, were visible, ossific union not being yet complete. There was no trace of any injury to the bladder, and the kidneys were free from any lesion.

CASE XVI.

Fracture of the Ilium, involving the Acetabulum.—Retention of Urine.—Hæmaturia.

A countryman, aged 30 years, lying in his cart with a fellow-workman, was driving home at night from the hay-market, when the belly-band of the cart broke and the horse took fright. Both men were pitched out on the road-way, and being intoxicated at the time no account could be had from them of the particulars of the accident. They were brought to the hospital next morning in a perfectly helpless state. One died within forty-eight hours, from injury to the spine, and the subject of this case presented all the local marks of severe contusion, principally engaging the right side of the pelvis and the adjoining hip-joint. The ecchymosis was created in the trochanteric, iliac, and inguinal regions. The slightest disturbance of the pelvis or of either lower extremity, especially of the right, was agonising; any control over its movements by the patient was wholly lost, and, on examination, the presence of a fracture of the ilium, involving the brim of the acetabulum, was satisfactorily made out. There were also retention of urine and severe hæmaturia. Both these symptoms continued for some days, with great irritability of the bladder, but ultimately all urinary distress subsided without the necessity of any special treatment, and at the end of two months, with the usual provisions for absolute fixity of the pelvis by bandage (the thigh being kept permanently extended, as in the ordinary fracture of the shaft of that bone),

the man left the hospital with excellent power of progression.

The occurrence of hæmaturia, with or without retention of urine, in fractures of the pelvis, where the ilium alone is the seat of fracture, is by no means frequent. Such retention generally passes off without the necessity for any operative interference, and the hæmaturia yields to the simplest treatment. Local fomentations, and perhaps some slight change in the position of the patient, relieve the one, and the mildest astringent and anodyne remedies remove the other. As regards the source of this hæmaturia, it is too often, as in other forms of that affection, very doubtful, notwithstanding the apparently unerring character of many of the symptoms. It is to be borne in mind that fracture of the pelvis, even with laceration of the kidneys, is not necessarily accompanied by hæmaturia as a symptom. I have seen one kidney lacerated, its capsule rent through, the loose areolar tissue surrounding it gorged with blood, and not a trace of it was discernible in the urine; and a most interesting case (Case VIII. p. 39), has already been detailed, in which the bladder was absolutely perforated from side to side, and yet the microscope was required to detect the presence of even a few blood corpuscles in the urine.

So far for obstructions of the urethra, referrible to injuries of the pelvis. Such cases are now comparatively rare, and hence they are more deserving of

notice. Many of them are very alarming, and run a rapid course—often terminating fatally within twenty-four, thirty-six, or forty-eight hours after the occurrence of the accident; some escape altogether and recover, whilst exceptional cases, among the most aggravated, will be met with, in which life is prolonged to the tenth or twelfth day or even longer, the sufferers ultimately falling victims to pelvic cellulitis. The following is a good illustration of such class of cases.

CASE XVII.

Injury of the Pelvis—Separation of the Bones of the Pubes at the Symphysis—Laceration of the Bladder—Gangrenous Cellulitis, extra- and intra-pelvic.

A bricklayer, aged 40, fell from a considerable height, tumbling across some scaffolding poles which were projecting from the walls of the building where he was at work. He was not brought to hospital until a week after the accident. He was then suffering from incessant desire and inability to pass water. A large tumour occupied the hypogastrium and extended towards the umbilicus, yet its outline did not accurately represent that of a distended bladder; it was more prominent on one side than on the other,—passing on the left as if into the pelvis, whilst on the right it was traceable forwards towards Poupart's ligament. There was extensive ecchymosis around the pelvis; the scrotum and perinæum were involved in it, and no

doubt could be entertained that a most serious injury of the pelvis, implicating the bladder and urethra, was inflicted. The symptoms in their details very much resemble those noted in Case XIV. The poor man survived until the twelfth day after the accident. On a post-mortem examination, the cellular tissues superficial to and beneath the abdominal muscles in the vicinity of the hypogastrium were found in a state of putrilage. A large quantity of foetid urine, mixed with blood, was partially enclosed within an irregular cavity, having the muscular wall of the abdomen in front, a mass of the small intestines softly glued together with recently effused lymph on the reflected peritoneum, above, and the bladder behind and beneath empty, and with extensive rents in its anterior portion immediately above the pubis. The pelvic areolar tissue and that around were in a state of gangrene, and infiltrated with foetid fluid mixed with air. The bones of the pelvis were separated at the symphysis pubis, and displaced so as to resemble in essential particulars the pelvis delineated at page 61; and yet after so severe an injury, this poor man lived for twelve days.

I shall conclude this subject of obstructions of the urethra from injuries of the pelvis with the following case, which I had an opportunity of seeing through the kindness of the regimental surgeon on duty; and although not perhaps exactly apposite, it may yet possess clinical interest.

CASE XVIII.

Punctured Wound of the Penis, involving the Urethra.—Extensive Ecchymosis.—Retention of Urine.—Recurring Attacks of Hæmorrhage from the Urethra.

A farrier in a dragoon regiment, quartered in one of our barracks in this city, was employed in his forge preparing rod-iron in the ordinary manner for making horse-shoe nails, when, whilst removing the heated rod from the furnace, and wheeling suddenly round to place it on the anvil, a comrade farrier who happened to be near was struck in the groin with the rod, which, passing through his dress, penetrated the integuments on the left side of the pubes, and entered the body of the penis obliquely near its root. He was immediately brought to the infirmary. There was instantaneous and severe hæmorrhage from the wound, and some from the urethra; and extensive ecchymosis, principally involving the subcutaneous cellular tissue of the penis and scrotum, rapidly took place. The extravasation into the former was so considerable as completely to conceal the glans, to obstruct the urethra from the elongation of the prepuce and the exaggerated phymosis which it produced, and to cause painful retention of urine. The hæmorrhage was for a time most violent, and was ultimately controlled by compression and by iced applications—the strictest antiphlogistic treatment being rigidly enforced—and the retention of urine was relieved without any instrumental interference, which had previously failed.

Notwithstanding the very formidable aspect of the case the result was most satisfactory, its progress to cure being only interrupted by painful erections, and by recurring hæmorrhages from the urethra. A circumscribed swelling and a lateral twist of the organ in the site of the original injury remained for a time, but all uneasy symptoms ultimately subsided, and the man after a month returned to duty. Even at this period the integuments of the penis and of the scrotum had not fully regained their natural colour, so thoroughly stained were they by the enormous extravasation of blood which had taken place.

CHAPTER III.

OBSTRUCTIONS OF THE URETHRA FROM CAUSES ARISING
FROM WITHOUT AND FROM WITHIN THAT CANAL.

MANY cases of obstruction of the urethra under this class have presented themselves in hospital, and selections from them may be considered under two separate sections: one, in which the cause of obstruction existed without the canal of the urethra; and the other in which the causes were within it.

CASE XIX.

Contusion of Pudenda.—Profuse Ecchymosis, obstructing the orifice of Urethra, producing Retention of Urine.—Simulated Hæmaturia.

A young woman, mother of four children, was kicked by her husband in the pudenda, and was carried to the hospital during my visit, about twenty minutes after the injury. She was pallid, faint, and sick, and complained of great pain in the region of the injury. On being examined, two enormous tumours were visible—one very prominent and somewhat spherical in shape, occupying the site of the mons

veneris and that of the hypogastrium; the other distending to their utmost the integuments of the right labium. This tumour in its vertical diameter reached beyond the fourchette, and in its transverse projected so much internally as to completely occlude the vagina, and displace the opposite labium, which was also partially swollen. There was then not the slightest discoloration of the integuments, but the vaginal surface of the tumour, when everted, was of a deep chocolate colour, remarkably tense, and painful on the slightest pressure. Temporary retention of urine supervened and was most distressing, but the bladder after a time acted spontaneously, and no subsequent urinary irritation of any moment occurred. The urine passed was often tinged with blood, but evidently from commixture with that fluid in its transit from the urethra. Within twenty-four hours there was a palpable diminution in the size of the tumours, especially in that over the pubis, and in proportion to their diminished tension a distinct emphysematous crackling was communicated to the fingers on compressing them. There was but little fever, and from day to day the integuments all round and the several ecchymosed structures yielded rapidly to ordinary remedies, and recovered their normal condition. The mucous lining of the right labium had given way, and a considerable quantity of blood, semi-fluid and semi-coagulated, had escaped through the rent, with great relief to the woman. She left the hospital at the end of a fortnight, being then free from any absolute suffering.

There is an excellent drawing of the local appearances of this injury in the museum of the hospital.

CASE XX.

Laceration of the Clitoris and Nympha.—Violent Hæmorrhage.—Retention of Urine.

A woman, unmarried, and aged between 30 and 40 years, was in the habit of sleeping on an ordinary iron bedstead, so placed in the corner of a narrow room that she was obliged to step across the foot-railing of the bed to reach it. She usually had a chair or stool to support one foot for that purpose, but on the last occasion this provision had been removed without her knowledge. In the act of getting out of the bed in the dark, a few hours before her application at the hospital, she slipped astride on the railing, and fell with great force forward on the naked pudenda. The pains she suffered were agonizing, and copious hæmorrhage from the vagina took place. When she reached the hospital she was almost blanched from loss of blood, with which her underdress and the lower part of the abdomen, etc., were extensively stained. On examination, the whole vulva and the vagina were found to be blocked up with coagulated blood, through which there was much oozing, and on removing the coagula each nympha stood prominently forward, dark in colour, and tensely injected with blood. In the base of the left nympha there was a rent, through which the end of the little finger freely passed into the

vagina ; in addition, the clitoris, at its division into its crura, was considerably torn, and the wound was bleeding profusely. A suitable compress was applied and arranged with bandaging so as not to interfere with the orifice of the urethra ; a large opiate was administered ; relays of small portions of ice were placed within the vagina, and a cooling lotion was directed to be applied around the pubis. Retention of urine, at first painfully urgent, yielded to treatment without the necessity for the catheter, and no hæmorrhage of any importance recurred. Much pain was complained of in the reparative stages of the injury, but the woman when she left the hospital, at the end of a month, expressed herself as free from any distress worth noting. The wound in the nymphæ had then completely cicatrized, and also that in the clitoris, and all urinary irritation had subsided.

The practical indications suggested by the details of these cases require no comment. Their diagnosis was unattended with difficulty, and their treatment was obvious—the important points for clinical notice being, the satisfactory subsidence of the laceration and ecchymosis, exaggerated as they both were, and the relief from the accompanying retention of urine without the necessity for operative interference, the result proving the value of avoiding any in such cases unless from imperative necessity. In a medico-legal point of view, moreover, the slow disappearance of the effects of the ecchymosis is not unimportant.

This unusual case may be here added, as exemplifying the effects of pressure on the urethra, at or near its vesical extremity.

CASE XXI.

Pressure on the Urethra from a Glass Bottle impacted in the Rectum.—Partial Retention of Urine.—Removal of Bottle.

A porter, employed in one of our public wine stores, between 45 and 50 years of age, and apparently in good bodily health, applied at the Richmond Hospital, stating that he had been in the habit of passing within the anus a bottle, with the object of relieving himself from internal piles, which he imagined had narrowed the gut, and were the cause of continued constipation of his bowels; that he had introduced it on many previous occasions; that he had always first introduced the mouth-end, and that by making pressure during its introduction on the sides of the gut, he fancied that he had widened it; that two days back he repeated his experiment, and in his usual position, with his usual care, whilst lying on his left side, his thighs being flexed on the pelvis, and that the bottle suddenly slipped from his grasp into the rectum—that he had not suffered very much pain, except when about to pass water or to go to stool, and that then his sufferings were acute, but that he had continued at his usual work during the subsequent day in order to be entitled to receive his week's pay; that he could not bear the sitting posture, but that he could by manage-

ment move about—in fact, that the amount of pain he suffered was comparatively trifling, and that it was paroxysmal. I hesitated at first to believe his statement, but yet deemed it prudent to examine the bowel, and without difficulty was enabled to trace with my finger the outline of the base of a glass bottle. It lay somewhat obliquely in the direction of the rectum, about one inch and a-half above the anus—the bottom being towards the sacrum, whilst the opposite mouth-end reached behind the pubis, and was almost fixedly placed in this position, but could not be felt—confirming the statement of the man respecting its mode of introduction. An attempt had been made when he applied at the hospital to remove the bottle, whereby a portion of the rim at its base was broken off, and a corresponding jagged opening was felt, into which the tip of a finger entered.

No distended bladder nor any abnormal condition being traceable in the hypogastrium I sent the man to hospital. A very unsatisfactory and unconnected account was given of the bottle. It was stated, however, to be a round three-ounce hair-oil bottle, with a narrow, short neck. The transverse diameter at its base was traced with the finger in the rectum, as being about two inches or so, but neither its height nor its mouth-end could be ascertained.

Having determined to remove it next day, a conical piece of prepared sponge-tent was directed to be inserted within the anus early in the morning. Notwithstanding every provision made respecting forceps, etc., protected with sponge and chamois

lining, the thinness of the glass yielded on the slightest pressure; yet, after very much painful manipulation the bottle was removed piecemeal, with the fingers in the rectum—some of the pieces being, as will be seen by the adjoining wood-cut, remarkable large and irregular.

Extreme difficulty was experienced in extricating the mouth-end fragment, its cut edge being turned towards the anus, and thus necessarily catching in the mucous lining of the bowel during traction. Every fragment was removed and the rectum syringed out. The conical sponge-tent, which had been introduced within the anus, failed to expand as was expected. The amount of blood lost during the operation was considerable, and was brightly arterial. Occasional small injections of iced water and the exhibition of opiates internally, relieved all painful sensation. No gritty particles of glass were detected in the after treatment of the case. The bowels were kept quiet for 48 hours, and ultimately gently acted upon by the ordinary cathartic rose mixture of the hospital. After ten days the man left the hospital free from suffering and able to resume his work, and subsequently reported himself as free from his former ailments.

The several portions of the broken bottle removed were arranged by Mr. Foot, one of the then resident pupils in the hospital—a young gentleman whose sad and premature death excited feelings of deep regret in the minds not only of the medical staff, but of his associate pupils, who witnessed his untiring industry in the performance of his duties.

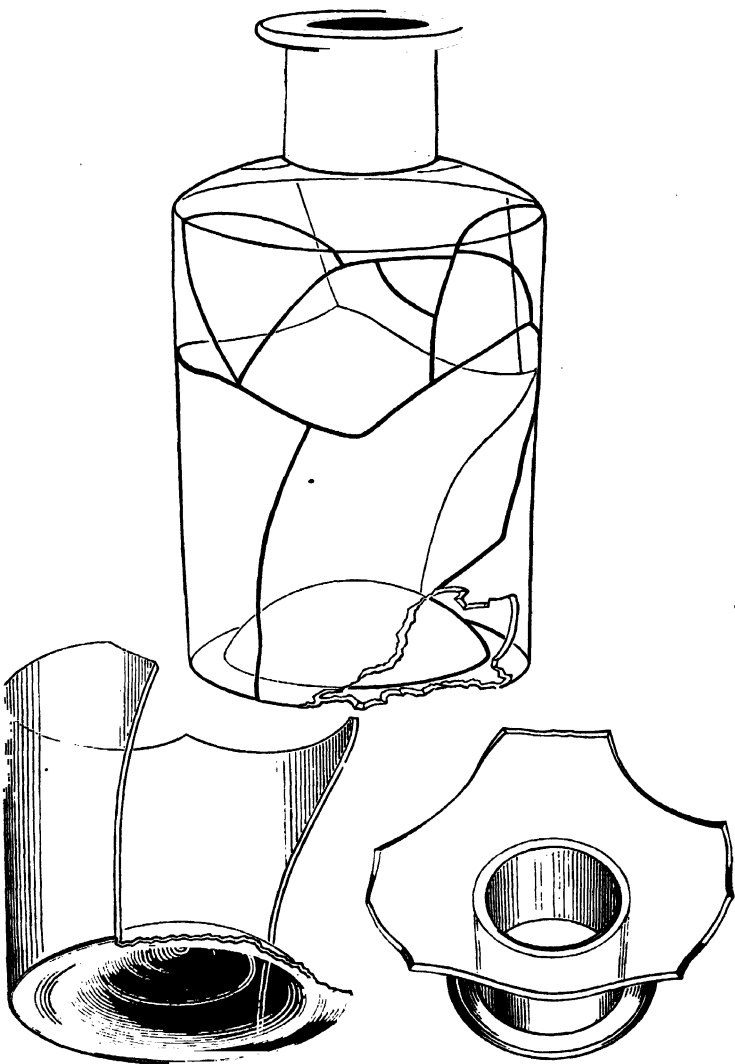


FIG. 2.—Bottle removed from the Rectum.

The outlines of the bottle, as to dimensions, and fissures, are accurately delineated in the preceding wood-cut.

In this case the question almost necessarily afterwards suggested itself, whether the bottle could not have been removed more satisfactorily by other means than by those adopted? The extensive flaw in its base noted as the result of an attempt at its extraction, complicated the after management; more especially when the peculiar mode of its introduction into the rectum, its large size, and the extreme thinness of the glass were considered. The encircling the bottle by some mechanical contrivance passed along its outer surface and secured around its neck, if it could have been felt, might have facilitated its removal, but this I found utterly impossible to accomplish. The history of the case, moreover, as regarded the symptoms of absolute disease of the bowel was most unsatisfactory. No prolapsus of the anus or of the rectum was stated to have been present—no hæmorrhage—no protrusion—during or after defecation, was complained of, and after the operation was performed no disease of the gut could be ascertained. I did calculate on an abnormal dilatation of the sphincters, which so often accompanies chronic diseases of the anus or of the rectum, and expected much advantage from such, in any operative proceeding which might have been deemed advisable, but I was disappointed—a very opposite condition of sphincters existed. The subjoined wood-cut illustrates the effects of the state of sphincters alluded to, both of anus and

rectum, in a case published many years back in a communication of mine on "Diseases of the Rectum," and in the Museum of the Richmond Hospital there is



FIG. 3. Prolapse of the Rectum.

an excellent drawing of it by Conolly. The case is one of so much practical value that I may be excused for transcribing it here.

CASE XXII.

Prolapse of the Anus and Rectum.—Absence of Urinary Irritation.—Operation.—Recovery.

A man, aged twenty-four years, of an unhealthy strumous aspect, was admitted into the Richmond Hospital in March, 1853, labouring under an enormous protrusion of the anus and rectum, which rendered his life miserable. His countenance was pallid, his frame attenuated, and the smell from his person most offensive, his clothes being saturated with the profuse involuntary discharge from the anus. From childhood

he was delicate, having had repeated diarrhoeal and dysenteric attacks, to the last of which he attributed the date of his present disease, when about twelve years of age. His habits had been very irregular, his sufferings from hardship and from his disease extreme, and his diet uncertain and innutritious. At the age of fifteen he contracted syphilis, and underwent protracted mercurial treatment. For his present disease he had been in hospital, but left without any appreciable benefit. He cannot remain for any time in the erect posture without the escape of the protrusion of the anus. He has constant and urgent desire to go to stool, and passes large quantities of fetid discharge tinged with blood. The escape of feculent matter is irregular both as to amount and consistence, and is always accompanied by a sensation as if the whole contents of the abdomen were escaping, and by the protrusion at the anus of a large painful tumour. There is a persistent, dull pain and uneasiness in the region of the rectum and pelvis, and his sufferings are less acute when the feculent discharges are solid than otherwise. He has little or no appetite, often nausea and vomiting, and is much tormented with flatulence; in fact, all the symptoms of aggravated dyspepsia are present. Under no circumstances has he irritability of the bladder. In the absence of any protrusion, the anus is patulous, and its circumference, covered with muco-sanguineous discharge, presents numerous ulcerated chinks in the direction of its rugæ. The anus is so wide, and the sphincter so relaxed, that a gaping, funnel-

shaped cavity is exposed, within which the fingers, placed conically, can be passed with ease. It and the greater portion of the rectum protruded on the slightest exertion, and constituted a tumour, as delineated in the accompanying woodcut, presenting somewhat the appearance of a prolapsed uterus. The circumference at its base exceeded nine inches, and a line drawn from the base to the free end, where the orifice of the bowel existed, was over four. The mucous membrane hung in loose, pendulous, and concentric folds. Its surface, when first exposed, was of a bright red, but in proportion to the duration of the prolapsus, it assumed a dark, congested modena colour, presenting irregular patches of ecchymoses, of adherent lymph, and of ulceration. It was by no means sensitive to pressure; on introducing the two fore-fingers within the intestinal orifice, grasping the protruded intestine between them and the thumb, and thus measuring the intervening depth from the anus, there was so much of thickness as to give the sensation of the complete prolapse of the bowel. It was curious to remark how the man replaced this vast protrusion, and sometimes he did so by muscular efforts alone, without the slightest manual help. He bent forward, pressed his hands on his knees, when a gradual diminution took place in the bulk of the protruded bowel, and then with a sudden gulp it disappeared, all being apparently effected by a combined and violent muscular effort. Again he failed in this and was obliged to assist it with his hands. It is unnecessary to specify the details of treatment during the months of March and April,

further than to state, that the horizontal position was enjoined, diet properly regulated, the regular action of the bowels ensured, and all the ordinary local means adopted to restore the healthy condition of the protruded bowel. On the 16th of April, although much dissatisfied, he acknowledged some improvement as to the amount of protrusion, and as to the discharge from the bowel, and the latter was obvious from the altered state of his linen, which was considerably less stained. The ulcers around the anus had a much more healthy appearance, and the rectal mucous surface was less loose and pendulous, much less congested, and the excoriated and ulcerated patches healed; yet the protrusion was considerable, and any operative measures appeared to me quite unsuited to his case, as well from the nature of his constitution as from the large extent of surfaces which should be necessarily implicated in them. It occurred to me that the object sought could be accomplished by another expedient, and with that view I formed four equidistant radiated tracts, with concentrated nitric acid, commencing them near the intestinal opening, at the apex of the protrusion, and passing them, as near as I could calculate, to the upper margin of the inner sphincter. The breadth of those tracts was about a quarter of an inch, and the length two inches. They were immediately well smeared with oil, and the bowel carefully returned. No pain was complained of during or subsequent to the application of the acid, which could be justly attributable to it—it was similar to that always complained of—it was relievable by the same expedients,

and it was not more severe during the act of defecation. There was no vesical, no abdominal irritation. From day to day there was noticed a diminution in the amount and in the frequency of the protrusion, and the irritability and uneasiness about the rectum and verge of the anus were less.

In a fortnight afterwards the protrusion of bowel occurred only once in twenty-four hours, and the mucous discharge also much diminished; defecation was natural and without pain; and he could cough, sneeze, and use any exertion without any protrusion, and also walk about without annoyance.

The acid was again applied, and on May 14th the bowel had not descended for many days; its contents were discharged regularly once in the twenty-four hours, and without pain, and without any appreciable amount of prolapsus. The discharge from the anus was much less. The man left of his own accord on the 4th of June, having then full control over the prolapsus, and the most healthy action of the bowel being established. In August he called on me, on his way with his fellow-workmen to see the Industrial Exhibition, and expressed himself as being perfectly free from the prolapsus, or any other annoyance.

This very exaggerated form of prolapsus is of rare occurrence in adult man, in the absence of injury or of disease causing an inefficient, if not complete, suspension of the action of the sphincters. Doubtless,

very large protrusions of the anus and of the rectum do occur, single or conjointly, from causes not now under consideration. The operative proceedings suggested by different authors may be suitable to special examples of these cases, but they are in very few instances, indeed, that I am aware of, persistently beneficial, and in all they are more or less hazardous. Those operations have for their object, mainly, the more perfect and complete closing of the sphincter, either by its shortened and divided fibres, or by the consolidation of these with the anal orifice, tegumentary or mucous. I am of opinion, however, that the result of the above case may lead to the hope that a milder mode of proceeding may be occasionally adopted, and that the agglutination of the mucous wall of the rectum to its muscular, by the establishment of healthy inflammatory action, can be effected in the manner I have detailed, so as to enable the special muscles about the lower aperture of the rectum to perform their natural offices. Moreover, the cicatrization of the several ulcerated chinks, the necessary result of the procedure, will tighten up the mucous membrane, so as to render such union permanent. In the particular locality I have marked, away from the external orifice, the mucous membrane appears to be as little sensitive as is the tracheal mucous membrane, distant from the larynx, and hence the comparative freedom from pain in the application of the remedy.

CASE XXIII.

Unusual Mutilation of the Penis.—Retention of Urine from Obstruction external to the Orifice of the Urethra.

A miserable-looking man, with double congenital varus, a shoe-maker by trade, aged about thirty years and married, in a drunken frolic with some companions exposed his penis whilst in a turgid state, when one of the party seized the organ, and forcibly dragging it forward, tore the integument through near the pubes as sharply as if they had been divided with a knife. Next morning, awakening from his drunken state, and unable to pass his urine, he applied at the Richmond Hospital, when the penis was found in a state of semi-erection, its superficial fasciæ bared, its veins distended and as if injected and dissected. The glans penis was partially concealed by the rolling over of the forward-drawn skin, matted with coagulated blood, and blocked over the orifice of the urethra. No appearances could be more forbidding than those presented. There was a general oozing of blood from the surface, and the pain complained of was intense, from the additional complication of retention of urine and straining efforts to discharge it. Placing him under the influence of chloroform, I unfolded the wrinkled integuments and secured their edges in position with a few points of interrupted suture. The retention of urine gave way whilst this was being accomplished, and the penis became less congested. He was treated both generally and locally, anti-

phlogistically, and relays of strips of lint, wetted with iced water, were gently strapped around the penis. The organ, notwithstanding all provisions against it, became more and more congested: a thick layer of blood was extravasated under the distended integuments, and these having presented next day an appearance threatening gangrene, I detached them as far as the corona glandis, and removed the sutures. Tepid applications with compound tincture of Benzoin were now substituted, the general treatment modified, and a healthy granulating surface was established within a week. The man, worried by rude remarks and inquiries, left hospital abruptly. Living in the neighbourhood, I heard subsequently that he did well and that his penis was much more seemly than he merited.

The above mutilation of the penis I had never met with amongst the many cases of injury I had seen. One of the pupils in attendance at the hospital at the time, who had been in Australia, mentioned to me that such mutilation is not unfrequently had recourse to by the natives as a mode of torture. The integuments of the penis are cut through with a knife at the pubic extremity of the organ, and then they are forcibly dragged off at the glans. Had I seen the case mentioned above, in a less congested state of the penis, I should have tried to secure the integuments *in situ*, and promote their union; but this treatment would be wholly unpromising in the then condition of the individual. It would appear to me better in this class of case to

anticipate any gangrenous action, and its accompanying fever by at once removing the whole detached and shrivelled integuments of the penis. A very good substitute for these may be hoped for, as occasionally seen in cases of severe burns or scalds involving and destroying the skin of the penis, in gangrenous cellulitis producing similar results, and in phagedenic or other ulcerations.

CASE XXIV.

Congenital Adhesion of the Labia Pudendæ in a Child.—Painful Micturition.—Peculiar Obstruction at the Orifice of the Urethra.

A little girl, two years and some months old, in progress of recovery from anasarca after scarlatina, was observed by her mother, for some days before my visit, to have repeated painful and urgent calls to pass water. This was discharged in small quantities with forcing efforts, and the paroxysms were accompanied by violent screaming. She also frequently applied the hand to the pudenda. The urine gradually assumed a deeply-coloured bloody hue, and gave a very clouded deposit. Its quantity, which at the commencement of the symptoms of anasarca had diminished, had for the last fortnight been as greatly increased, but until within the above-mentioned period had not produced any uneasiness. In the same proportion the general dropsical symptoms disappeared.

The night before my visit, the paroxysms of

urinary distress had been almost constant. I had been frequently in attendance on the child for ordinary ailments, and had not observed any symptom of urinary irritation.

The almost sudden supervention of the symptoms, their local character, and their extreme severity, led me to suspect the presence of calculus in the bladder or urethra, but on proceeding with an examination, to my surprise I found the labia adherent from before backwards, with the exception of two openings, through which little more than the point of a small probe could be introduced. One of these openings existed at the forepart immediately behind the clitoris, and the other posteriorly in the site of the fourchette. The intermediate junction was very consistent in front without the presence of any raphe, and as it approached the perinæum, it resolved itself into a membranous line almost transparent. During my examination a paroxysm came on, when I had the opportunity of witnessing the mode of the passage of the urine—almost *guttatim* through the openings, with a marked protrusion of the intermediate band.

Placing the child on its back, in the ordinary position for such an operation, the division of the band was effected by running a sharp pointed bistoury from behind forwards, along a fine director, when a difficulty presented itself for which I was unprepared. The orifice of the urethra could not be found, notwithstanding the most minute search, in addition to unavailing efforts to induce the child to pass water when under observation. I was obliged to rest

satisfied with what had been already accomplished, having arranged that after the resulting hæmorrhage had ceased, I should renew the attempt. Whether from apprehension of pain or from the decided relief obtained, there was no return of the severe paroxysms, and the child remained as tranquil as could have been expected, passed no water throughout the day, but in the course of the evening while asleep, a large quantity escaped involuntarily, perfectly colourless. The same took place the following day and night, and nothing remarkable occurred until about the eighth or tenth day after the operation. On this day the child was enabled to sit up and pass water in that position, but there was some slight return of the paroxysms, and the urine was somewhat coloured. I took an opportunity of making a very close examination, with the view of ascertaining the urethral orifice. Introducing a small curved probe director into the vagina, and cautiously drawing it forward along its vesical wall, with its concavity forward, I found that it hitched under a thin membranous, almost cribriform veil, and reached the clitoris. This membrane I divided with a scissors in the median line, and on its division observed a small patulous opening at the entrance of the vagina, which I concluded to be the orifice of the urethra. Since this, the case has proceeded most favourably, no recurrence of the hæmaturia has taken place, and all symptoms of irritability of the bladder have subsided.

I have repeatedly seen the child pass water, and

lately examined her, when I perceived the orifice above alluded to, certainly more anterior than it was two months before. I would not be allowed to introduce any instrument into the bladder, yet from the subsidence of all former symptoms, from the stream in which the urine flows, and the force with which it is ejected, I am fully satisfied all obstruction is removed.

The points which appear to me interesting in the details of the above case resolve themselves into the following :—

1. The peculiarity of the obstruction to the free evacuation of the urine, and its congenital character.
2. The period of the supervention of the vesical irritation and the hæmaturia; and,
3. The remarkably rapid subsidence of these symptoms on the removal of the obstruction.

Simple congenital adhesion of the labia pudendæ is not rare, and when present is usually detected in the earlier months of childhood, and the separation is easily effected by the surgeon. So strongly impressed with the certainty of its detection at an early period are authors on the diseases of children, that much doubt is entertained by some as to its congenital nature when discovered after the sixth or twelfth month. It is only surprising in the case above related that it should have escaped observation, not alone from the mode of its union, but also from the presence of the two small communications mentioned.

A second opinion could not be entertained as to

its congenital character, the possibility of its being adventitious being removed by the perfectly smooth, soft, and uninterrupted surface of the joined labia, the absence of any cicatrix, and the previous history of the case. The presence of the opening at the perinæum was very favourable to the result of the operation and ensured its success. The most interesting circumstance, however, connected with the case was, perhaps, the peculiarity of the orifice of the urethra. It is particularly deserving of notice, and would probably have escaped my observation at the time had not my attention been specially directed to it. Failing to discover it by every manœuvre, I concluded that it might have been more posterior than natural, and might have opened into the vagina. The result proved such to be very nearly the fact, as on the division of the fine membrane which concealed it, the orifice was near the entrance of the vagina. From the fact I have stated above, of this opening being more anterior than at the time of the operation, I am strongly inclined to attribute its former abnormal situation to the gradual effect produced by the band described acting as a sort of valve, opposing the free exit of the urine, forcing it back into the vagina, which, thus becoming elongated, dragged with it the urethra, and altered the position of its orifice—an effect somewhat similar to that produced in the adult in the advanced stages of pregnancy.

As in some measure bearing upon this subject, I may refer to a case to be found in *Warner's Cases*

in Surgery. The age of the child, the attendant symptoms, and the existence of a fold of membrane concealing the urethra, have somewhat of an analogy, more in the symptoms than in the actual position of the velum, as in this case the velum was an anterior prolongation of the hymen. The case is as follows, (page 237):—

“In the year 1740, I was consulted in the case of a little girl about three years old, who had laboured under such violent symptoms in voiding her urine ever since her birth, as to make it suspected by her physician that she had a stone in her bladder. Upon inquiry I was informed that her urine came away by drops, that she was inclined to put her hand to the pudenda when she made water, and that she could not help crying and stamping with her feet, merely from the pain. These symptoms so nearly resembled those of the stone, that I thought proper to propose the passing a staff into the bladder, that we might be satisfied whether there was a stone, or any other disease of the urethra or bladder; but upon endeavouring to do it, I observed the urethra was at least half covered over with a continuation of the hymen, which appeared imperforated; for this reason I could with difficulty execute my design. However, I effected the introduction of the instrument into the bladder without using much violence, but there was no stone, or any other preternatural appearance to be felt in that, or its passage. Seeing this, I gave my opinion that the difficulties and pains which arose in discharging the urine, probably pro-

ceeded from the size and situation of this membrane, which I recommended as necessary to be divided. The operation was complied with, and I accordingly proceeded in the following manner: The infant being placed upon her back, and properly confined upon a table of a convenient height, in the same manner as is done in the operation for the stone, I divided the membrane with a small knife, by making a longitudinal incision, and the patient was cured in a few days by anointing the parts with sweet oil, assisted with an emollient fomentation."

Considering the congenital nature of the obstruction, and the absence of any appreciable irritation until the period above stated, we are obliged to refer the train of symptoms which set in to the increased urinary excretion called into operation by the treatment adopted for the removal of the anasarca. Were it not that it was on its almost complete subsidence that they appeared, the extension of the serous effusion into the cellular structure in the immediate vicinity of the pudenda might have produced tumefaction, and so increased the operation of the obstruction in effecting the irritation; but this not being the case, we must refer it to the above cause.* Previously to this period, the quantity of urine passed by the child was probably normal, and was discharged under circumstances most favourable to its exit. Until the symptoms of irritation set in, the child was constantly in the habit of discharging (perhaps involuntarily) its

* This explanation would be only admissible if the urinary symptoms set in when the anasarca was at its height.

urine in the bed, or in a position much facilitating its passage; but as soon as those symptoms appeared the child would hardly remain in bed, and was incessantly forcing and straining, with the most pitiable cries, to evacuate not more than a table-spoonful at a time—the quantity, however, altogether, in the twenty-four hours, amounting to at least a pint and a half.

How, then, can we account for the irritation, how for the bloody tinge in the urine, and how for the cessation of these symptoms?

The following explanation appears to me, to a certain extent, satisfactory:—

The increased quantity of urine distending the bladder, and probably discharged with increased force, was directed in a line towards the back of the vagina by the fold of membrane *reflected over the orifice of the urethra*; afterwards, meeting with the imperforate labia, an *additional* obstacle to its exit took place—it distilled through the superior and inferior openings, distended the septum, and was forced against the walls of the vagina. To this may be added the influence of the velum in closing the opening of the vagina when the urine was propelled against it from behind, an influence to which we must attach more weight, inasmuch as the symptoms were not completely removed until the division of this part was effected. The necessary repetition of those different causes irritated the mucous lining of the vagina, and as the effect of repeated irritation on this delicate membrane produced either a partial

abrasion of some portion of its surface and consequent hæmorrhage, or affected the whole surface generally, and hence communicated to the urine the tinge required.

This appears to me the more probable, when we regard the small quantity of urine discharged during each paroxysm, and necessarily detained within the vagina; and again, when we consider the small quantity of blood which may effect a change in its colour.

The great relief obtained from the division of the labia proves the share that that obstruction had in producing the urinary distress; and the subsequent division of the velum confirms the opinion that it assisted it. The disappearance of blood from the urine, although the quantity of the latter continued equally profuse, favours the opinion that the presence of the former was at all events influenced by the above mechanical causes.

CASE XXV.

Acute Inflammatory Phymosis.—Gangrenous Ulceration of Prepuce.—Violent Hæmorrhage.—Retention of Urine from Obstruction of the Urethra external to that Canal.

A policeman, aged about twenty-five years and of stout build, was carried to the Richmond Hospital in the middle of the night on a stretcher, having been accidentally found in bed by one of his comrades, faint and in a state of extreme weakness. When he

reached the hospital he was perfectly blanched and almost pulseless, and his trowsers and under-clothes were drenched with blood and urine. The penis and scrotum were concealed from view by an enormous mass of coagulated blood, a portion of which protruded so much beyond the rest as to give the pupil in charge the idea that there was a large fungoid growth from the right side of the penis, and that from this the hæmorrhage originated. In the weak state of the man it was utterly impossible to learn any satisfactory history of the case at my visit, and his prostration was so great that the immediate command of the bleeding was imperative.

I removed as much of the coagulated blood as I could, and perceived that I had to deal with a most aggravated case of "acute inflammatory phymosis;" that the projecting coagulum had burst through an irregular, jagged, gangrenous opening, about the size of a shilling, on the right side of the prepuce, and about an inch and a-half from its orifice; that bright arterial blood with urinous smell was welling up through this mass, and that on tracing the source of the hæmorrhage it proceeded from a deep excavated ulcer situated on the corresponding part of the glans penis underneath. I at once slit up the prepuce in the middle line in front, and trimming it on each side towards the frænum, without any consideration for the inflammatory conditions present, carefully applied the requisite dressings, and directed the usual general treatment, in which Hoffman's anodyne and Battley's sedative constituted the principal therapeutic agents.

The hæmorrhage was stayed without the necessity for any ligature and never recurred ; the wounds and ulcerated surfaces healed kindly, and the man was convalescent within a month from the date of his admission into hospital.

He remained afterwards well, as far as I could learn, a deep chink yet existing in the site of the ulcer. This, during the erect state of the organ, produced some inconvenience from the crooked shape it assumed, a portion of the glans, and an adjoining portion of the right crus of the penis, having been involved in the ulceration. It was ultimately ascertained that the situation of the original ulcer on the penis was on the right side of the corona glandis, that the use of mercury was commenced (the man still performing his usual duties), and that acute inflammatory phymosis supervened, followed by gangrene of the prepuce and the destructive ulceration noted.

Cases such as the above, the symptoms of which are, perhaps, too briefly reported, must be familiar to every hospital and dispensary surgeon. Inflammatory phymosis presents itself sometimes in a very acute form, and again in a sub-acute or chronic form. It is to be met with at every period of life, but especially in the adult; and at each period, different causes may produce it. Want of cleanliness, excoriations, warty growths, and above all ulceration, whether specific or not, between the glans and prepuce, but more especially along the corona and near the frænum, are familiar examples of the conditions which give rise to the affection. Without considering the symptoms

in detail, there are two, either of which occurring in the progress of acute inflammatory phymosis demands the promptest action on the part of the surgeon—the one is hæmorrhage, as in the above case; the other, retention of urine, partial or complete. Loss of life, rapid destruction of the penis, or permanent lesions which no surgical ingenuity could remedy, may result from neglect. Cases might be instanced in illustration, from the trifling gangrene of the prepuce to the more serious gangrene of the glans, and the still more serious exposure of the urethra by sloughing or ulceration of a portion of the body of the organ. The surgeon may, however, hope for a successful issue in many even extreme cases of acute inflammatory phymosis, by means of local and general remedies familiar to all; but in the special cases I allude to there is but one course open to him, and he must be prompt in adopting it, as otherwise the future comfort of his patient may, within a very few hours, be altogether compromised. Local inflammation is at its height, the organ is enormously swollen, and to such an extent in the majority of cases, that the orifice of the prepuce is often two or three inches in advance of that of the urethra. The surgeon's operation, then, must be "*l'operation de conve-nance.*" He must first divide the prepuce in the mesial line up to the corona, and so expose the glans as to be satisfied that it is free from constrictions of any kind. He can then remove any redundant portions of the prepuce, confining his incisions within such limits as will ensure a shapely protection of the glans.

Trifling as this operation appears to be, caution is requisite on account of the distorted and twisted prepuce, and its tightened orifice, as the director may otherwise pass inadvertently into the urethra, as we have known to occur, and the glans penis be included in the section. To avoid such a casualty, the end of the director should be kept in close contact with the under surface of the prepuce, and pressed forward so as to guide the bistoury or knife to its limit at the site of the corona. The above treatment I have rarely seen followed by any untoward results. However irregular in its curative stages the original seat of ulceration may be, the fresh wound-surfaces heal most favourably; neither phagedena nor gangrenous ulceration attacking them, although the lines of the incision may have been made in the immediate seat of such conditions.

The dressings I apply are usually narrow slips of lint dipped in the compound tincture of benzoin, with or without the addition of tepid water, placing over them a tight compress of requisite size, shaped somewhat like a Maltese cross, with an opening in its central portion opposite to the orifice of the urethra. The compress is damped with cold or iced water, and so moulded to the glans penis as to embrace it fully, and so lapped over the recent wound-surfaces, that a narrow strip of lint or calico will secure the edges, and, at the same time, exercise a gentle uniform compression. If any vessels bleed they may be ligatured or twisted.

The general treatment is equally important. I find no remedy so successful in the early stages of

such cases as tartar emetic solutions, either alone or combined with some preparation of opium, in tolerably large doses; kept under check, however, as to any absolute narcotic effect, and corrected by proper attention to the state of the bowels. The circumstances of some cases require the exhibition of stimulants. I may incidentally remark that I have not used mercury with any other object than that of an aperient or purgative, and I have not had reason to regret it. I have given to the violent inflammatory processes and their results the chances of producing the same salutary destructive action upon the specific disease, if it existed, which is contemplated in caustic or escharotic applications. If constitutional symptoms should ultimately spring up, I find that they are of a comparatively mild and manageable form, and not of that mongrel, worrying character which too often baffles the surgeon in his treatment, and impresses his patient with most unfavourable notions as to his therapeutic remedies.

With respect to retention of urine as complicating such cases, it is all-important to recognise its presence. It is a most important symptom, and too often it may escape detection, especially if incontinence of urine accompanies it.

I have seen a very aggravated case in an office clerk who applied at hospital with retention of urine. He concealed altogether its cause, but on proceeding to relieve him, I found the penis, rolled in his pocket-

handkerchief as a temporary bandage, soddened with blood, which was oozing rapidly from between its folds. An inflammatory phymosis in its most severe form presented itself. Sharp bleeding from the orifice of the prepuce accompanied it, and the groins, the region of the pubis, and the perinæum were completely concealed by fluid and coagulated blood.

The outlines of a largely distended bladder were fully traceable above the pubis, and strong efforts were being made to empty it. The same operative expedients were rapidly adopted as in the above case, and the bladder quickly relieved itself. It is imperative, then, on the surgeon, in the progress of cases similar to the above, to watch carefully the condition of the bladder.

Apart from the attendant pains and recurring attacks of dysuria, inflammatory symptoms and even hæmorrhage may be superinduced and aggravated by being overlooked.

In addition to these obstructions of the urethra ordinarily met with, the tract of that canal is sometimes interrupted by the pressure of tumours, the result of diseases in its vicinity, such as abscesses, diseases of the testicle, hernia, with or without hydrocele, existing either separately or conjointly. I have met with such cases at all periods of life. In some cases irritability of the bladder may occur; in others, there is absolute retention of urine. The suitable treatment of such a class of cases cannot be overrated. The following case is illustrative of the foregoing remarks.

CASE XXVI.

Hydrocele of the Tunica Vaginalis in the Infant.—Retention of Urine.—Relief by Tapping the Hydrocele.

A well-thriven male infant, aged between three and four weeks, was brought to me to the Richmond Hospital, the mother stating that the child appeared to suffer pain before passing water, and that occasionally there were paroxysmal attacks accompanied by total interruption to its escape; that a fulness of the scrotum attracted her attention shortly after the birth of the child; that this fulness was on the increase; and that it was now accompanied with much tenderness when handled. I found that the integuments of the scrotum were of natural colour; that a tumour the size of an ordinary hen-egg occupied its right side; that the outline of the testicle on the left side could be accurately traced, whilst that on the right side was wholly obscured; but that the upper part of the cord on that side could be distinctly felt and isolated. The existence of a hydrocele of the tunica vaginalis was obvious. A mild aperient was administered, and an evaporating lotion applied to the tumour, but without any beneficial effect. Next day there was much pain and tension in the tumour, complete retention of urine, and the child had frequent paroxysms of straining efforts to evacuate the bladder. I introduced a No. 2 trochar and canula into the hydrocele, which gave exit to about two ounces of light straw-coloured fluid, and then gently compressing the hypogastrium, a large quantity of urine freely escaped. The bladder

speedily recovered itself, and the distressing symptoms did not again return.

CASE XXVII.

Obstruction of the Urethra from a solid Concretion between the Prepuce and the Glans.

The following case is instructive, from the peculiar situation which the calculous concretion occupied:—

A shoemaker, aged about twenty-five years, applied to me with that form of retention of urine which so closely approximates in its nature incontinence. He stated that he never had sexual intercourse. He complained of the ordinary symptoms of obstructed urethra; his urine occasionally dribbled from him, and his clothes were often wetted with it. These attacks were sometimes paroxysmal, and then, in addition to the above symptoms, agony was experienced when any attempt at erection of the penis took place. For two or three years he had been more or less a sufferer, but through mistaken delicacy he hesitated to apply for advice, until he took it into his head to marry. On examining him, the shape of the penis struck me as very remarkable: an enormous glans, with an elongated prepuce tightly stretched over it, appeared to be superadded to a miserable, attenuated, and misshapen body of an organ, with foetid urine dribbling from a very contracted preputial orifice. A stony hardness was communicated to the fingers on feeling this protuberant glans, and a mor-

tary-looking stuff, with abominable urinous odour, was pressed from under the prepuce on squeezing it. The great object of the man was to restrain any erection of the organ, for when it occurred during a paroxysm of micturition, absolute retention of urine was the result, which, terminating in incontinence, spontaneously subsided when the tension of the penis passed off. With a blunt probe passed underneath and around the prepuce, the cause of the hardness was at once detected. After a few days' dilatation of the orifice of the prepuce with prepared sponge, a director was introduced, and an enormous mass of hard, concrete, calculous material was removed in detached portions, leaving the glans underneath deeply pitted, and so shrivelled as almost to escape recognition. The orifice of the urethra lay obscured in one of those pits, had an offset of the concretion in it, and was excoriated all around it. On subsequent examination of the urethra, I found decided stricture at its orifice, and again about the region of the bulb. Both strictures yielded to ordinary treatment by dilatation, and the man ultimately got perfectly well. Within six months he married. In about six subsequently he called at the dispensary for advice respecting some passing ailment, when I learned that all was right as regarded his former complaints. In examination I perceived that the penis was fairly developed, and the glans and prepuce tolerably natural in appearance.

The concretion removed was composed of phosphates, was in portions very thick, and somewhat laminated; it weighed above a drachm and a-half,

and was of considerable bulk. When adjusted, so as to attempt to restore it to its original form, it resembled an irregular mould of a glans penis.

This case is as practically instructive as it is rare. Morbid deposits are commonly found between the glans and prepuce, and some persons are peculiarly prone to them, but they are not often of the nature above noted. I have, however, met with them limitedly so in adult and in advanced life, where congenital phymosis has existed; where the prepuce was very long; where its opening was very small; and where the orifice of the urethra did not correspond to it. In the turgid state of the organ the relative condition of those openings is completely altered. The glans, in the majority of such cases, is, perhaps from mechanical causes, not developed proportionably with the body of the penis, and sexual intercourse may hence be as much interfered with as its ultimate object often is. If very great cleanliness be not observed, most annoying accumulations will take place under such conditions; and if the cause be not remedied, stricture of the urethra at its orifice may arise.*

* As the following case bears upon the subject, I beg to append it:—A servant-man, aged about 40 years, and in good bodily health, applies occasionally at hospital, to be relieved from ordinary symptoms of stricture. Its rational and sensible signs are decided, and the site of the stricture is in the region of the bulb. No appreciable constitutional symptoms have manifested themselves. His stricture bears bougie or catheter well, but it is very recurrent in its nature. If neglected beyond a month, the rational signs become very troublesome, and the introduction of even a small instrument requires nice manipulation. This man gives the following account of his case:—In early life he got an attack of inflammatory phymosis, from exposure to infection; whether gonorrhœa accompanied it or not is not quite

Obstructions of the urethra from causes arising within that canal are common. They are sometimes met with in the progress of disease of some portion of the urinary apparatus, and are too often contingent on this treatment. During the escape of a calculus from the bladder, or the fragment of a calculus after the operation of lithotrity, abrasion or other injury of the urethra may arise, and be productive of serious results, as is apparent from details given in many of the cases under consideration. No more common instances of the kind can be adduced than those injuries which are the result of careless or ill-applied catheterism, whether performed by the surgeon or by the patient. It is almost useless to particularise cases of the kind. Every surgeon is conversant with them, and few, if any, can free themselves from the charge of having added to the number. The urethra is sometimes treated with most unaccountable roughness, and too often coarse manipulation in the use of instruments appears to be the

certain. A patch of gangrene of the prepuce took place in the usual situation, which, it would appear, was too limited to allow the glans to pass through it. At this spot the glans and prepuce became consolidated together, and a foramen exists at the margin of the cicatrix, which admits the point of a catheter, about No. 10 size, to course around the glans. A hard osseous-feeling plate, to the extent of about a sixpence, occupies this locality, and is matted to the glans. This man has married twice; he has had no family by either wife, although each was of early age, and in good bodily health. He has always suffered an uncomfortable feeling at the end of coition, as if some obstruction existed. I have seen partial priapism after the introduction of a beugie or catheter, and have satisfied myself that a regular valve is then thrown across the urethral orifice and the contracted prepuce. That stricture arises from this contingency I am fully satisfied, and I believe that effectual treatment of that disease is interrupted by it.

measure of the dexterity and skill of the surgeon. He is frequently rash in having recourse to any operative interference whatever as regards the urethra; he is careless in the selection of a suitable instrument; he is reckless in its direction and in its management, and particularly as regards the position in which he should place his patient for its introduction. Cases often occur in which irremediable mischiefs have been done, even in the most healthy condition of the urethra, through the unscientific performance of this every-day operation of catheterism. The following illustration may be instructive.

CASE XXVIII.

Retention of Urine from Intemperance.—Rough and unsuccessful Catheterism.—Profuse Hæmorrhage from the Urethra.

A middle-aged man, a tailor by trade, and not previously the subject of any urinary ailment, was suddenly attacked with retention of urine after partaking largely of spirituous drinks. Ordinary treatment not having relieved him, and repeated attempts to reach the bladder having failed with either a silver or gum-elastic catheter, the man was obliged to apply at hospital. I found the bladder was then tensely distended with urine; the penis was full and congested, and there was considerable bleeding from the urethra. He was yet under the influence of drink, was not very manageable, and was making forcible

and straining efforts to empty his bladder. He was placed in bed; the penis, scrotum, and hypogastrium were directed to be enveloped in hot stupe-cloths, wrung out of a strong decoction of tobacco, and some tartar emetic and opium in a mixture were administered. Nausea and vomiting followed; the penis became flaccid, and the bladder gradually discharged its contents without the necessity for a catheter. All urinary irritation subsequently quickly subsided, and under ordinary treatment the case progressed favourably.

CASE XXIX.

Retention of Urine during Acute Gonorrhœa.—Rough and unsuccessful Catheterism.—Laceration of the Urethra, with profuse Hæmorrhage.—Modified Catheterism.

A young man in rude health, under treatment for gonorrhœa in its acute stage, was, after a fit of dissipation, attacked with symptoms of agonising dysuria. The penis became sensitive and turgid; high fever and retention of urine followed. The man applied at hospital, where repeated attempts had been made without success to relieve him by catheterism. His condition became now most distressing; violent paroxysms of dysuria frequently recurred, and during them painful erections of the penis were specially distressing. Blood at the same time was flowing from the urethra. The hypogastrium was exquisitely tender, and the bladder was full of urine. In this condition he was admitted.

During my visit venesection was at once had recourse to. The tartar emetic mixture of the hospital formula, with hyoscyamus and sulphate of magnesia, was administered. But from the extreme agony of the man, and the tense state of the bladder, I deemed it advisable to relieve him by the catheter; and passing a conical gum-elastic instrument of medium size, I found that the urethra was blocked up with blood. Pressing my finger along the urethra from the perinæum, I slowly withdrew the catheter, when an enormous quantity of coagulated blood, moulded to the canal, escaped through its orifice. Now gently introducing the catheter, it reached the bladder with trifling interruption, and gave exit to a large quantity of limpid urine. Before the bladder was fully emptied, I slowly removed the instrument; whilst doing so directing the man to make the effort to pass water in a full stream at the same time. The urine escaped, and all uneasiness subsided under the ordinary treatment of saline aperients and anodynes, diuretics, baths, perfect rest, and restricted dietary. The catheter was not required afterwards.

When the penis is in a state of congestion (in some cases almost bordering on priapism, as in the case above reported) the operation of catheterism is most objectionable. It should never be had recourse to except under the most urgent and pressing circumstances, every expedient having been previously adopted by the surgeon to dispense with its use. In some cases, especially in those of acute gonorrhœa in young subjects, where retention of urine occurs, venesection may be advisable; in others, local bleeding followed

by copious fomentations, medicated or otherwise, as in the above case, will be found most effective ; and in all the exhibition of tartar emetic and opium, combined with saline cathartic or diuretic medicines, in doses proportioned to the urgency of the symptoms, and repeated at intervals, will prove most useful adjuncts. I attach very much value to the stuping with the tobacco fomentations, as noted. I have found them most effectual, even in cases of paroxysmal retention of urine identified with stricture.

CASE XXX.

Retention of Urine from Stricture.—False Passage from Catheterism.—Limited Extravasation of Urine, and limited Gangrene of Penis.

A man, aged about 30 years, had congenital phimosis. He was of most dissipated and irregular habits ; sometimes acting as a waiter in a common tavern, and again as steward on board a colonial sailing vessel. He had gonorrhœa many years back, and for a long time had laboured under stricture of the urethra, situated about three inches from the orifice, very unmanageable, and very obstinate. Occasionally his paroxysms of difficult micturition were most violent, and during them retention and incontinence of urine often recurred. Such attacks were almost always accompanied by priapism. His stricture was long and narrow, surrounded by a good deal of thickness and hardness, and almost impassable by

any instrument. The straight conical bougie, metallic or gum-elastic, appeared to be the instrument which was usually successful. In one of these fits of stricture an attempt was made to introduce a gum-elastic catheter, between 3 and 4 in size, partial priapism being present. The catheter was first used with a curved stilet; then without a stilet; and again, when both expedients failed, *the curved stilet was attempted to be passed through the catheter, whilst the latter was impacted in the stricture.* Most agonizing pain and severe hæmorrhage followed on this occasion; the presence of the instrument could not be tolerated, and it was necessarily withdrawn, when the stilet was found *pointing through the eye at the end.* Under treatment, however, by baths and medicine, the priapism gradually diminished, and the urine escaped *guttatim.* Now, from day to day, a partially circumscribed hardness surrounded the seat of the stricture; the penis became swollen and rigid; its under part in front of the scrotum, and the integuments, became involved in the swelling, and rapidly put on a dark gangrenous appearance, which, on being freely incised, exposed a sloughy mass through which foetid urine and pus filtered out, the slough on being detached leaving a gap in the body of the penis and in the urethra. When healed the penis had an appearance as if it had been broken in two, and had united in a very bent position, the concavity being directed upwards.

In this case the whole of the urethra was involved in the sloughing process. In a second case, of which there is an excellent drawing in the museum of the

Richmond Hospital, in its earlier progress the upper wall escaped, whilst the floor was destroyed to nearly half an inch in extent, the adjoining fibrous covering of the body of the penis being implicated in the sloughing process.

CASE XXX.

Retention of Urine from chronic Enlargement of Prostate Gland.—Urethra ruptured by careless Catheterism.—Extravasation of Urine into Structure of Penis, and subsequent Gangrene of Organ.

A pensioner, advanced in life, and for many years liable to attacks of retention of urine occurring in prostatic disease, attempted to relieve himself from one of them whilst under the influence of drink, with an old gum-elastic catheter. He failed to do so, although he passed the instrument to the usual distance, with and without the stilet. Severe hæmorrhage from the urethra took place, and the penis, turgid at the time, became suddenly more swollen and distended. Perpetual oozing of blood continued, and incontinence of urine set in, which relieved his painful symptoms of retention so much, that he did not apply at hospital until about forty-eight hours after the accident. He was now partially comatose; his stomach was irritable, his tongue was dry and brown, his pulse dicrotous, and his skin damp and cold. He had bronchitic râles scattered throughout the lungs, and the abdomen was

tympanitic. A particularly disagreeable odour exhaled from his body, his clothes being perfectly saturated with blood and most foetid urine. There was no indication in the hypogastrium of a distended bladder. Over the symphysis of the pubis there was some abnormal fulness, accompanied with œdema and an obscure emphysematous crackling on pressure. The penis presented, throughout, the appearance usually seen in the worst forms of gangrenous erysipelas, the integuments being tensely swollen and of a dusky-red colour, with darkish vesicles irregularly scattered over them. The portion of glans uncovered by the prepuce had a bluish-slate hue and a pasty feel; and the whole organ, almost fully erect, gave a distinct semioedematous and crepitating feel when compressed. The scrotum was perfectly loose and flaccid, and so was the perinæum. The man was placed in a warm bed; stimulants were largely exhibited, and free incisions were made along the penis, which exposed the corpora cavernosa and the corpus spongiosum in a state of complete slough, and filled with putrid urine. Notwithstanding all the precautions adopted, the greater part of the penis fell into gangrene, and fatal prostration set in within twenty-four hours after the admission of the man into hospital. The corpora cavernosa and the corpus spongiosum, under the deadened integuments, were one mass of soft putrilage, and a false passage was satisfactorily traceable through the bulb of the urethra, the areolar tissue around being infiltrated with a dark greenish fluid. A similar appearance was to be seen at the root of the penis, both in front and be-

hind the symphysis of the pubis. Such were the morbid appearances traceable to the local lesion of the urethra.

Cases more instructive can rarely be brought forward in connexion with the subject of injury to the urethra from ill-applied catheterism. They are specially valuable as regards the inadvisability, unless from the most imperative necessity, of the introduction of instruments into the urethra in the congested state of the penis; and they are equally so in reference to the proper selection and adaptation of that class of catheter solely applicable under the circumstances. As usually purchased, gum-elastic catheters are not provided with suitable stilets; they are often too short—often too loose—and very often too tight. In the two first instances such stilets are very hazardous, and in both they dispose to the breaking or the bending of the catheter at its weakest part, should it meet with any obstruction. I have known the extreme end to break off in this situation; and repeated opportunities are afforded of witnessing similar mischief from the tilting back of the stilet, when it fits too loosely at the handle. Again, equal if not more mischief is done by attempting to remove an obstruction to the passage of a catheter, by the partial or complete withdrawal of a stilet, and *by its subsequent replacement*, as it too often happens that in the latter movement the end of the stilet passes through the opening in the catheter, and perforates the urethra. Again, it may be remarked that catheters will occasionally be met with, in ap-

pearance beautifully smooth and pliable, and yet most fragile, breaking off like a piece of thin glass if bent in the slightest degree. The extent or the effects of the mischief done under such circumstances cannot be calculated upon. Cases XXIX. and XXX. illustrate

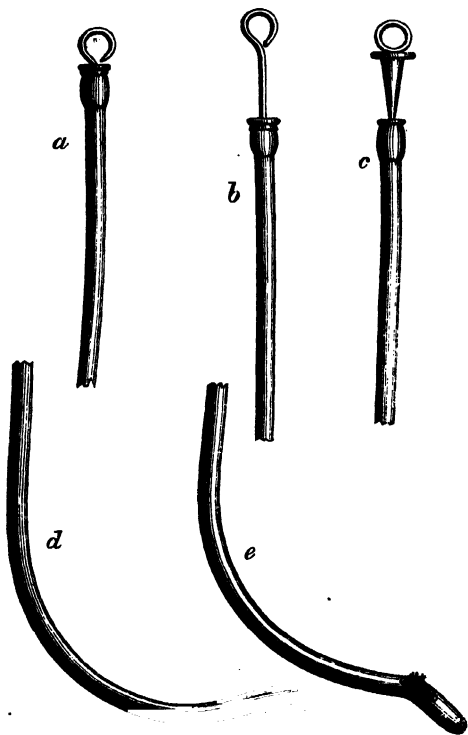


FIG. 4.—Showing accidents in Catheterism.

such contingencies, the modes of production of which are well delineated in the woodcuts marked *d* and *e*. The tilting up of the stilet I allude to is shown in woodcut marked *b*, whilst that marked *c* shows a pro-

vision in the handle, which will tend to prevent its recoil, especially in those cases in which a delicate wire may be required.

Abrasion of the urethra, or other injury to it *from within*, as during the passage of morbid urine, or during the escape of a calculus, may be productive of a train of formidable symptoms, for which the surgeon should be prepared. As regards my own observation, such cases are more frequent in childhood than in more advanced life.

CHAPTER IV.

OBSTRUCTIONS OF THE URETHRA BY FOREIGN BODIES
WITHIN THAT CANAL.

OBSTRUCTIONS of the canal of the urethra by foreign bodies introduced from without, or the result of disease, being of frequent occurrence, I wish to devote the present chapter to a selection from such cases as I have met with. The foreign bodies introduced from without and causing obstruction to the urethra, are of the most varied nature, whilst those which are the result of disease are chiefly (1) calculous concretions, originating in the urethra; (2) calculi arrested during their escape from the bladder; and (3) fragments of calculi after the operation of lithotrity. Of the former class of obstructions the more common instances are the result of careless catheterism, as well when the canal of the urethra is perfectly healthy as when it is the reverse. If the nature of the case is such as to require the instrument to remain in the urethra, the surgeon often does not take sufficient precautionary measures to guard against its breaking or slipping into the bladder. These last mentioned causes more particularly provide cases suitable to this chapter.

In the arrangement of the following cases, those of obstruction from foreign bodies introduced from without are placed first, and those from disease, subsequently.

CASE XXXI.

Obstruction of the Urethra by a piece of broken Catheter.

A pensioner, aged between 45 and 50 years, and apparently in good bodily health, applied with retention of urine, stating that his symptoms were so very urgent he had attempted to relieve himself, as was his custom, with a gum-elastic catheter; that on this occasion the end of the catheter snapped off as he was withdrawing it; and that now the broken piece was impacted in a stricture under which he laboured for many years, situated far back in the passage. On examining the catheter I found it to be about the size of No. 4, with a rusty stilet fitted rather tightly to it, and with about half an inch or so of its extreme end deficient. The symptoms of retention of urine were very urgent, but not more so than had been experienced on many previous occasions. The bladder was to be felt distended above the pubes, yet free from any appreciable amount of pain on pressure. The penis was nearly semi-erect, and the urethra, in its perineal and anal portions especially, was so very hard, unyielding, and tender, that it was idle to form any opinion as to the site of the broken catheter by any external examination. I at once admitted the man into hospital, directed a large emollient enema to be administered, a hip-bath

to be quickly prepared, a mixture containing tartar-emetic and opium to be given at short intervals, and diluent drinks to be taken *ad libitum*. Within a few hours I visited the hospital. The directions given were being carried out; a severe paroxysm of dysuria occurred during my visit, and out shot the piece of catheter, as here delineated, followed by an enormous

FIG. 5.—Piece of Catheter expelled from the Urethra.

gush of urine. I now passed a gum-elastic instrument of medium calibre into the bladder without difficulty, secured it there, allowed the urine to flow in an uninterrupted stream, continued the opium and tartar-emetic treatment at lengthened intervals, and in a few days the man left hospital, relieved from all his distressing symptoms.

CASE XXXII.

Obstruction of the Urethra by a piece of Thorn-twig introduced to relieve Retention of Urine from Stricture.—Removal by Operation.

This case also occurred in a pensioner; he was about the same age, and in much the same condition of bodily health as the former. He had been for years the subject of stricture, and was in the habit of introducing small-sized catheters to relieve any accession of difficult micturition. He was employed in hay-making, when, being suddenly seized with retention

of urine, he had no instrument near him, and, away from assistance, he procured a twig of thorn of a size and length with that of the catheter he ordinarily used. He introduced it into the urethra; it passed in further than he expected, and every effort having failed to extract it, he applied at the hospital after walking a distance of seven or eight miles. The twig had been twenty-four hours or more concealed in the urethra; its anterior extremity could be felt in front of the scrotum, and, with the finger in the rectum, the distal end was traceable in the membranous portion of the urethra. The bladder was empty; the penis was flaccid; the urine was flowing involuntarily; and the man was free from pain or fever, in the intervals between some paroxysmal attacks. I admitted him into hospital, and was enabled with ordinary precautionary means to seize the end of the twig with a urethral forceps, but found it was so softened and friable that each grasp of the forceps failed to secure it sufficiently firmly to extract it; and moreover, that it apparently recoiled into the urethra at each effort. I now had the urethra firmly grasped in the perinæum, and the foreign body as if pushed forwards towards the glans, when, feeling the end of the twig in front of the scrotum, and fixing it, I cut down on it in the direction of the urethra to the extent of about a quarter of an inch and removed it, its length and dimensions being exactly as marked in the accompanying woodcut. (Fig. 6.)

I secured a gum-elastic catheter in the bladder of suitable size, fixed a plug in it, and directed the

bladder to be emptied at regular intervals. After forty-eight hours I removed the catheter. The wound healed without any trouble ; no extravasation of

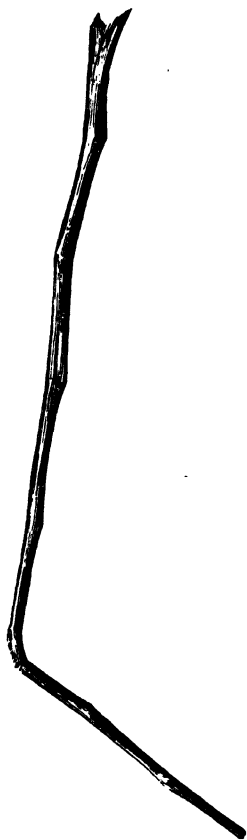


FIG. 6.—Twig removed from the Urethra.

any kind took place, and after about ten days the man left hospital with his urethra in as perfect a state as his stricture would admit, and without a trace of fistula.

CASE XXXIII.

Obstruction of the Urethra by a long piece of Scutch-grass introduced to relieve Retention of Urine from Stricture.

A middle-aged man applied for relief at the Richmond Hospital, stating that he had introduced a long piece of scutch-grass into his urethra to relieve a stricture from which he had been suffering for some time. He brought with him a portion of the grass, which had broken off, and which corresponded to the size of No. 3 catheter. The penis was full and congested. The outline of the foreign body could be felt along the scrotal and perinæal portions of the urethra. I placed the man sitting forward before me on a chair, introduced a urethral forceps, and at once removed the straw. It measured $7\frac{1}{2}$ inches in length, and is in the museum of the College of Surgeons, in the same bottle with the thorn-twigg alluded to in the last case.

CASE XXXIV.

Obstruction of the Urethra by a Bougie.—Its Escape into the Bladder.—Removal by Allarton's Operation.

The subject of this case was a gas-fitter, aged about 45 years, who had led an irregular life. For many years he laboured under stricture, and suffered from repeated attacks of retention of urine, from perineal abscesses, and from urinary fistula. He never submitted to treatment for any length of time. As soon as relieved from his prominent symptoms of suffering he would leave hospital; and ultimately he was in the habit of treating himself when he found the stream

of his urine deficient, by the occasional introduction of a cat-gut, or a small-sized gum-elastic catheter or bougie. Being apprehensive of an attack of retention of urine, he passed a small No. 3 or 4 gum-elastic bougie to its full length into the urethra, and finding it tightly grasped, he rolled a handkerchief round the penis and scrotum, and ventured to go to his work without removing the instrument. The urine in the meantime trickled along, and when returning to breakfast he found to his dismay that the bougie had disappeared. He was satisfied that it had slipped into the bladder. Failing to get relief elsewhere, he applied to me a week after the accident. His sufferings were not then very acute, although there was some constitutional disturbance, and some paroxysms of dysuria seized him at irregular intervals; the urine escaped almost *guttatim*, and there was no fulness in the region of the bladder. It was impossible to feel the bougie along any portion of the urethra, the whole tract being unnaturally hardened from protracted disease, and the perinæum being one mass of irregular cicatrices. To attempt at the time to ascertain the condition of the urethra by catheter or bougie, would have been rash; indeed, the experiment had been made previously to his application to me, immediately after the accident, and had been productive of no benefit. Symptoms of urinary fever soon set in, and with them considerable irritability of the bladder, and difficulty in micturition. At this period I attempted to strike the instrument in the perinæum, guided by the sensations communicated to myself as well as by

those felt by the patient, but I failed. I allowed the wound to suppurate, with the hope that I might ultimately succeed, but was again disappointed. A long interval now elapsed, during which a succession of rigors occurred, followed by the usual train of constitutional urinary disturbance. His fever became continued, his stomach irritable, his appetite failed him, and general debility and emaciation occurred. His symptoms assumed a most aggravated character. Micturition became more frequent and more difficult; and the urine, heretofore of average density, fair quantity, and acid, although loaded with pus, now became highly ammoniacal; and stringy flakes of mucus obstructed still more the tract of the urethra, and distressed him excessively. The poor fellow left hospital in this condition; he was unwilling to submit to any operative treatment, and from his shattered state and prolonged urinary ailments I did not urge him to it. Repeated attacks of retention of urine added to his misery, to relieve which catheters were found to be indispensable, and after a short time No. 6 catheter could be introduced. About this period I tried a silver catheter, and ultimately a sound with a view to detect the bougie. The sensible signs of its presence were very unsatisfactory, and the rational were necessarily equivocal from the complicated nature of the case. Worn out by his sufferings he again returned to hospital, and cried out for even temporary relief. Though obliged to use a small staff, I performed Allarton's operation of "Lithotomy Simplified," dilating the wound with Weiss's urethral dilator. As

regarded the operation, nothing could be more satisfactory. As rapidly as in the most successful lateral operation for the stone the bougie was removed from the bladder, encrusted with phosphatic deposit, but so soft and pliable at the time that it could be rolled up into any shape. Its length was about six inches, its size that originally mentioned, and when struck by a sound or other metallic instrument, equally



FIG. 7.—Bougie removed from the Bladder.

unsatisfactory evidence was given of its nature in the then moist state. Placed in a bottle, it assumed the coiled form represented in the foregoing woodcut.

After the operation it was most gratifying to observe the rapid subsidence of the distressing sufferings during and after micturition. No hæmorrhage occurred worth noting; the pain experienced was referred to the wound alone, and for three or four days the relief was so great and the general improvement so obvious, that very favourable expectations were entertained of recovery. Suddenly nausea and vomiting, uncontrollable by any means which could be devised, set in; the stomach would retain no nourishment, fluid or otherwise; the secretion of urine

ceased, and the poor man died exhausted, his intellect continuing unimpaired until within a short period before his death. The kidneys and bladder were removed for examination, and presented that condition throughout both so constantly seen in protracted cases of obstinate stricture. Even in the pelvis of each kidney there were discernible patches of phosphatic deposit, intermixed with mucus. It was, as regarded the neck of the bladder, satisfactory to see that it was uninjured in the slightest degree by the operation performed. A very excellent sketch of those morbid appearances is to be found in the museum of the Richmond Hospital.

Attention being specially directed to the presence of a foreign body in the urethra, in cases such as the above, the only consideration for the surgeon is to accomplish its removal as quickly as it is possible, on account of the remarkable fact that in such cases there is the strongest disposition to the passage of the foreign body towards or into the bladder. Opportunities are afforded of witnessing this in the everyday treatment of stricture with gum-elastic bougies or catheters. Should the instrument not be sufficiently long, or should it be unsafely secured at its anterior end, it certainly will, more quickly than may be anticipated, pass within the urethra considerably behind its orifice, and, if not checked, it will escape rapidly into the bladder. This may be effected by a vermicular action of the urethra, and perhaps, additionally by a suction effort from a *distending* bladder exercising a sort of traction whereby the instrument

may easily pass backwards, assisted as it is by the condition of the canal behind the seat of stricture, and the equally congested state of the organ in front of it, which may render it more fixed. This contingency of the passing backwards of a catheter, or bougie, in the treatment of stricture particularly, I have often seen, and I have known it to cause great alarm to patient and surgeon. I have, however, usually succeeded in obviating any serious casualty by at once grasping the penis laterally either in its scrotal or perinæal portion, or in both, firmly pressing it, with the catheter or bougie within, towards the orifice of the urethra with one hand, whilst with the other the glans is pushed back on the instrument; or when it has receded still further, the same object may be accomplished by the finger in the rectum exercising similar pressure on the end of the catheter or bougie in that locality. In advancing this explanation, however, we must not overlook the fact that, as in the œsophagus, a certain instinctive action is inherent in the urethra to direct its course. In no instance should an attempt be made to test the site of the foreign body with a sound, catheter, or other instrument, or to remove it with forceps or other contrivance through the tract of the urethra, until every precaution is adopted to prevent its passing into or towards the bladder.

Let it be effected how it may, the surgeon should adopt every means in his power for the prompt removal of any foreign body introduced into the urethra from without. He will often accomplish it in the healthy condition of the urethra, in the adult,

and in advanced life, with one of the many appliances devised for the purpose; but in the child, and in the diseased urethra, difficulties often present themselves which cannot be surmounted by such measures, and which hence will oblige him to have recourse to operative procedures. I might mention other cases illustrative of this class, but I wish to limit myself to those which have occurred under my immediate observation, and which appear to possess more than ordinary interest.

Foreign bodies originating in the urethra, and obstructing the flow of urine, are comparatively rarely met with. They are usually associated with disease in that canal, and consist of calculous material, more or less incorporated with morbid secretions generated in their immediate vicinity, thus constituting distinct concrete masses of irregular form and size, or, as in the following instance, consisting of a cylindrical concretion moulded in the urethra, and solid throughout or pipe-like. The following cases illustrate this class.

CASE XXXV.

Obstruction of the Urethra by Double Stricture and by a peculiarly-shaped Concretion within it.—Escape of the latter after Catheterism.

A pensioner, aged about forty years, who had served his full time in the East India Company's service, suffered from a stricture situated about two and a-half or three inches from the orifice of the urethra, and a se-

cond near the bulb. His symptoms were of a most aggravated character. There was hurried and frequent micturition; there were recurring attacks of retention of urine, partial and complete; there was almost persistent incontinence of urine, and there was the usual train of constitutional symptoms distinctly intermittent in their character. He had laboured under these symptoms, more or less intense, for three or four years. He attributed his strictures to repeated attacks of gonorrhœa, in which injections had been freely used, and to perpetual dissipation. Since his discharge from the army he was usually his own surgeon, and his ordinary treatment was the introduction of a gum-elastic catheter armed with a stilette. When he came under my notice he was suffering from most severe retention of urine: I found him with a fresh accession of sharp urinary fever. He was bathed in perspiration; his pulse was rapid, and the other usual symptoms were present. He had failed to relieve himself by his ordinary medicines, by baths or by catheter. His bladder was full and distended above the pubes; the paroxysms of pain were severe and frequent, and only a drop or so of urine escaped with every laboured effort he made to pass it. There was priapism. The urethra, from the seat of the anterior stricture to the prostate, felt as hard as a board; there was no local evidence of any abscess, or of any disposition to it. Some of the urine which had escaped was collected in a glass. Its odour was heavy, its colour turbid; it had alkaline reaction, and was full of tenacious mucus. Its density was about 1·020. I gave him a full

opiate, and ordered the region of the bladder, the penis, scrotum, and perinæum to be fomented with an infusion of tobacco of the strength of a quarter ounce to a quart or so of boiling water. Some temporary relief followed; the penis became somewhat flaccid, and the desire for micturition was less frequent. I took advantage of an interval of ease, and introduced rapidly a conical gum-elastic catheter, without a stilette. It passed freely through the first stricture; at the bulb it met with much resistance, yet to my sensation the point entered the stricture in that region, and urine obviously flowed through the instrument. I waited until another effort to pass water occurred. A frightful paroxysm came on: he felt some obstruction give way, and cried out for the withdrawal of the instrument. I anticipated the worst result, when I happened to observe that the urine escaped in a stream from the urethra, and that that stream was again and again interrupted. At the orifice of the urethra, a darkish-looking substance now presented itself, which I caught between my fingers, and, drawing it out, found it to be a solid mould of the urethra, as delineated below. The bladder afterwards fully



FIG. 8.—Cylindrical Concretion removed from Urethra.

emptied itself, and all severe symptoms gradually subsided. The man attended as a dispensary patient, but would not remain in hospital; and after a short time I was enabled to introduce No. 6 catheter, which

I advised him to leave occasionally in the bladder. The quantity and quality of the urine improved, his general condition also; and ultimately he again became his own surgeon.

At the time of the removal of this concretion it was consistent and firm, but as it dried it became friable—in fact, so much so that the slightest violence chipped it, and it has now lost about half-an-inch of its length.

CASE XXXVI.

Obstruction of the Urethra by Stricture and Calculous Concretions behind it.—Urinary Abscess and Fistula.—Escape of Concretions after Dilatation of the Stricture.

A man, aged 44–5 years, formerly a soldier in the Spanish service, now a town labourer, applied at hospital with a large abscess, partially circumscribed, and occupying the anterior part of the perinæum and the adjoining portion of the scrotum. The ordinary local symptoms and considerable constitutional disturbance accompanied it. It appeared to originate from injury done to the urethra in an attempt some days previously to pass a gum-elastic catheter through a stricture of old standing in the region of the bulb. The man was a perfect adept in the use of an instrument, and kept at bay for seven or eight years a stricture which had previously been most unmanageable and serious, as appeared from cicatrices in his scrotum and perinæum, formerly connected with it. The requisite treatment for the abscess was adopted:

fistula in perinæo was its temporary result, which after a short time healed, No. 8 catheter being passed with ease, and occasional vesical irritation alone remaining. His general health vastly improved, and with the exception of alternating mucous and purulent deposits in the urine, but not in large quantity, or persistent, this secretion much improved also. Under these circumstances he left the hospital. He was a man extremely observant of his symptoms, and very intelligent. After a fortnight he again applied to me, and stated that although he could pass No. 6 or 8 catheter with ease, he had an amount of irritability of bladder he could not account for; that there was constant uneasiness, often producing pain about the anus; and that, to his sensations, there was a small moveable pebble, as he termed it, behind the seat of the stricture, which he often felt when making water, and again in the perinæum when he moved about. I introduced a short metallic-topped gum-elastic bougie into the urethra, and when it reached about the membranous portion I felt a distinct grating of a calculus. I now passed a sound, and it was equally manifest, and with the finger in the rectum not a doubt could be entertained of its presence and situation. I recommended the man to return to hospital, and contemplated either crushing the calculus with a small lithotrite, or removing it by excision through the perinæum. In the interim larger instruments were from day to day introduced into the bladder, and allowed to remain for a time with the view of accumulating the urine in the bladder. Small and ir-

regular pieces of concretion, distinctly phosphatic, passed off; and on one occasion a large mass obstructed the passage, when, with assistance, and with the finger in the rectum, by forcible compression he crushed it and relieved himself. Whilst in hospital many similar portions escaped till they gradually disappeared, and he continued very well free from any former annoyance. The bladder became tolerant of at least half a pint of urine at a time, and the stream was continuous and large.

In the dilated portion of the urethra behind a stricture, if such dilatation should exist, it is not very unusual to meet with distinct and separate masses of those concretions. The more minute of them sometimes become fixed in the narrowed portion of the canal, and the still more minute portions coating its interior produce the most agonising sufferings, as in the following distressing case.

CASE XXXVII.

Obstruction of the Urethra by Stricture and Calculous Concretions.—Extreme Irritability of the Bladder.—Lateral Lithotomy.

A man, beyond middle age, hitherto in comfortable and independent circumstances, and with a peculiarly sallow aspect, was, in early life, intemperate in his habits. For some years past he had laboured under stricture of the urethra, and between his sufferings

from it and from mental annoyances, he had latterly become an opium-eater. Whilst under treatment during one of his severe attacks, I was brought by a medical friend to relieve him from retention of urine. Amongst the several cases I have seen of the disease, I never met with one accompanied with more excruciating sufferings. Many unsuccessful attempts had been made before my visit, to introduce instruments into the bladder, and thus failure had only tended to add to his misery. His penis and his dress were saturated with abominably foetid urine, constantly dribbling from the urethra; in fact the whole organ was as irritable as the poor man himself, and he dreaded even the approach of a surgeon. He described his sufferings as being particularly agonising from the passage of gritty particles in the urine, and the sudden stop to its flow from the presence of larger portions in the stricture. He was constantly squeezing the penis and the perinæum, as if to force them back. In the deposit of the highly morbid urine which he had near him, these particles were quite visible, forming dirty whitish patches, dappling the surface of the viscid mucus. They were visible even on the sides of the urinal, and were easily felt gritting between the fingers. The microscope confirmed their phosphatic character. I need not add that very considerable constitutional disturbance was also present. He was now tired out with general treatment, and would submit to no more. The whole theme of his complaint was the painful distress in his efforts to pass water, and the unceasing calls to do so; he wished for the introduc-

tion of an instrument, and yet he dreaded it, as all previous attempts had failed. At last he hazarded the trial of one, and I selected a No. 4 gum-elastic catheter with a well-fitting and firm stilet. It luckily reached the bladder without much interruption. It was firmly grasped whilst entering a stricture about the bulb, and here gave the distinct sensation as if passing through a tube of the coarsest sand-paper. Not less than half a pint of urine escaped, and with great relief, though unfortunately only temporary. The catheter which I had secured in the bladder now became blocked with tenacious mucus, and after six or eight hours all the symptoms of fresh retention of urine returned. In his impatience he removed the instrument, and again and again there were demands for its introduction. Under its use and ordinary general management the stream of urine ultimately improved, and many small calculous particles escaped. The stricture was yet very irritable, and was liable to repeated spasms, which no treatment relieved. His large doses of laudanum, which often exceeded two ounces in twenty-four hours, were perfectly futile, and no other anodyne or other treatment was of a particle of benefit. At last, under the partial effects of chloroform, I reached up to No. 8 silver catheter, and slight improvement in his symptoms took place. Still more satisfactory evidence now existed of the presence of distinct calculous concretions beyond the seat of the stricture, and with the instrument in the bladder, they could be distinctly felt through the rectum. The man could roll them

away with his finger, when they interrupted the stream of urine, and so relieve himself. About this period the late Sir Philip Crampton met me in consultation, satisfied himself as to the nature of the case, and unpromising as it was in every respect, considered I was yet justified in complying with the desire of the man to make an effort to remove the calculi by operation, as ordinary expedients or lithotrity were wholly inadmissible, both from the contracted condition of the urethra and its extreme sensibility, and from the excessive irritability of the bladder. With this object in view the man was transferred to hospital. The impression being, from the history of the case, that the calculi might occasionally pass into the bladder, or that an additional calculus existed there, and the sound confirming such supposition, I at first intended to perform Allarton's operation; subsequently, however, it was decided that the ordinary lateral operation would be the more advisable, as it was apprehended that the vesical calculus, if present, might be large, and no measurement of it could be attained. Doubts, however, could not otherwise than exist on the subject, from the utter impossibility of commanding a searching movement of the staff or sound, it was so absolutely viced in the urethra, and moreover the sensations communicated by the presence of calculi in the canal added to the deception. Neither were the effects of chloroform satisfactory, most annoying spasmodic muscular movements occurring under it throughout the whole proceedings, although pain was wholly annulled. However, the lateral

operation of lithotomy was performed safely and expeditiously. The knife grated against the calculi in its course, but, to my discomfiture, only a few minute portions of concretion were found in the bladder, and of so small a size that it was impossible to seize them satisfactorily with the forceps. When suppuration was established, however, two portions, about the size of a garden pea each, were removed from the deepest angle of the wound. They crumbled under the forceps. No untoward result arose from the operation, but I could not say that any substantial relief was given to the principal sufferings of the man. The wound healed in due time; the stream of urine improved, but the irritable bladder and the urethra continued to annoy him, and the urine continued alkaline. He left the hospital at the end of a month or so, took a sudden dislike to opium in any form, and to all kind of nourishment; his stomach became irritable, and when apparently improving, he was suddenly carried off by a fit, which, from the description given to me, was epileptic.

I secured the urinary organs. The kidneys were congested, and somewhat hypertrophied; the pelves and ureters were slightly dilated; there were local signs of pyelitis; the bladder was not as much contracted as might have been expected, neither were its walls very much thickened; a pouch was found at its upper fundus, and the usual trabecular arrangements of its muscular coat were present. There were the signs of chronic cystitis; there was no calculus of any description in the bladder; there was a very remarkable developed cross bar behind the

prostate gland, which latter was not much altered either as to size or structure. The wound in the urethra, the result of the operation, was cicatrised and accurate in its extent. The site of the stricture was at the commencement of the bulb; and nothing peculiar was to be noted in its anatomical characters.

CASE XXXVIII.

Obstruction of Urethra from Calculous Concretion behind seat of Stricture.—Bursting of Urethra.—Gangrene of Scrotum.

A butcher's slaughterer, aged about forty years, had been for a long period labouring under stricture of the urethra. Leading a life of continued dissipation, he was constantly attacked with retention of urine, for which he sought relief at the adjoining dispensary or hospital. His general health did not appear to be materially impaired by it. After a fit of drinking he was again seized with retention of urine; he neglected applying for assistance for some days, when, being attacked with fever, he was supposed to be labouring under the prevailing epidemic. He was brought to hospital, having all the local symptoms of ruptured urethra; the bladder was empty; the scrotum was one sheet of gangrene; the pulse was tolerable; the temperature uniform; but every other symptom was most unfavourable. Temporary relief followed the ordinary local and general treatment by incisions and stimulants. The gangrene, however, advanced,

and coma was superadded to the symptoms. He died in about thirty-six hours after admission into hospital.

The stricture lay in front of the bulb; the urethra there and behind the strictured portion presented a shreddy slough throughout; and a calculous mass, about the size of a small Spanish nut, was contained within it. It was distinctly a phosphatic concretion, and crumbled under pressure.

Many opportunities are afforded to the surgeon of seeing instances of this class of obstructions to the passage of the urine through the urethra. Such cases arising from calculi are by no means rare in the infant, in the child, and in advanced age. They are, perhaps, more frequent at those periods than in adult life, but even then they may occur, and, however equivocal the premonitory symptoms of their existence may be, when they become fixed in the urethra special signs arise, which in the vast majority of instances leave little doubt as to their presence. For obvious reasons such calculi are much more common in the male than in the female subject. I have, however, removed a small roughened calculus of lithate of ammonia from within the orifice of the urethra of a little girl, aged from two to three years, and I have removed one of oxalate of lime, in size and shape like a plum-stone, from the urethra of an unmarried woman. In neither of these cases was there urinary distress of any amount. In each case the calculus was discovered by chance, and this rather with the desire to be satisfied as to the absence of any local

lesion, than from any idea of the presence of a calculus.* Cases similar to the following, however, are much more likely to occur, and are probably familiar to every practical surgeon.

* In a valuable communication by Dr. Montgomery, in the fourth volume of the "DUBLIN HOSPITAL GAZETTE," page 353, entitled "Illustrations of the Reciprocal Sympathies between the Uterus and Bladder in Woman," a case is detailed in which I removed a remarkably-shaped calculus fairly referrible to the class now under consideration. The case is particularly interesting, and highly creditable to the accuracy of diagnosis of Dr. Montgomery, inasmuch as previously to his having been consulted, the opinion entertained was conclusive as to the existence of cancer of the uterus. After making a careful examination, Dr. Montgomery says:—"I could discover no disease of the uterus, but the neck of the bladder was distended, and felt very hard; I passed a sound, which at once struck against a stone of considerable size." I was called on to remove this calculus, and I may add to the symptoms noted by Dr. Montgomery, that there was partial incontinence of urine, and that this fluid was alkaline, and loaded with mucus and phosphates. The principle of the operation required was the combination of dilatation of the urethra with incision. The instrument I used was Weiss's dilator, as modified by the late Sir Philip Crampton, and without any delay or difficulty my finger reached the stone. I required no forceps, being enabled to poise out the calculus with the fore-finger of the left hand in the bladder, and that of the right in the vagina, whereby it was easily pressed out. My impression was, that the stone was in a pouch, partly urethral and partly vesical; and this opinion was confirmed by the statement that "the neck of the bladder was distended, and felt very hard," by the ease with which my finger reached the stone, and by its shape, which is accurately outlined in the annexed wood-cut. A section



FIG. 9.—Calculus removed from Bladder of Female.

of the calculus presented a lithic acid nucleus, surrounded and cased in a thick phosphatic coating. Recovery was perfect.

CASE XXXIX.

Obstruction of the Orifice of the Urethra of an Infant by a Calculus.—Retention of Urine.—Congenital Phymosis.

An infant, aged from nine to ten months, was brought to hospital incessantly screaming, and apparently writhing in agony. The mother stated that for the last few days he was attacked by some inward pains, which came on in paroxysms, and that neither baths, nor medicine, nor stuping had relieved him; that his urine was not as abundant as usual; that when it escaped, the child strained a good deal and cried with pain; and that for the last twenty-four hours no urine had passed. He was a well-developed child, and had never suffered before, except from some of the ordinary affections of children.

He was now perfectly unmanageable from his sufferings; and his countenance was so full and congested from efforts of straining to pass water, that there was good reason to apprehend a fit of convulsions. His penis was perfectly rigid, and his bladder filled with urine. I passed my finger along the urethra, and in the glans felt a distinct hardness. The orifice of the prepuce was so small that the blunt end of a delicate probe with difficulty entered it, and gritted against something solid. To introduce a forceps was utterly impracticable, until I divided the prepuce, when a small calculus presented itself, fixed firmly in the urethra, and requiring no small amount of traction to remove it; a large gush of urine followed, and the child was relieved. The calculus was rough, slightly

oval, and about the size of a split pea. It answered to the ignition test for oxalate of lime.

CASE XL.

Obstruction of the Urethra of a Child by a Calculus.— Retention of Urine.

A healthy boy, aged from nine to ten years, was suddenly attacked with retention of urine, the evening before his application at hospital. As a gum-elastic instrument entered the bladder, a calculus was suspected to exist from the sensation conveyed. Five or six months previously to this, the boy had some irritability of the bladder, but never before suffered from retention of urine. The desire to pass water recurred in severe paroxysms, and at the time the bladder was tensely full of urine. I felt outside a hard oval body, in front of the bulb of the urethra, which, with the efforts of the child, distinctly moved backwards towards the bladder. I grasped it between my fingers, and was surprised with what facility I was enabled to get it in front of the scrotum. Here it became so perfectly fixed, that I could not remove it, with forceps or otherwise. Ascertaining that it was a calculus, I secured it steadily, made a small incision on it, and extracted it with ease. I passed a gum-elastic catheter into the bladder, and fixed it there for forty-eight hours. No urinary extravasation or inflammation of any moment resulted, and within a week the wound had all but healed, the tract of the canal being perfect.

The calculus was irregularly oblong, rough, pointed at each extremity, and with a sulcus underneath its centre, and not unlike a date stone. It measured about six or eight lines in its long diameter and three in its transverse, and consisted principally of oxalate of lime.

CASE XLI.

Obstruction of the Urethra by a remarkable Calculus.—

Simulated Gonorrhœa.—Partial Retention of Urine.—

Simple Hydrocele of the Tunica Vaginalis.

A stout, healthy-looking man, aged from forty-four to forty-five years, by occupation a drayman, applied at hospital with the apparent symptoms of ordinary acute gonorrhœa. The penis was full and congested, the glans particularly so, and a copious purulent discharge flowed from the urethra. He passed urine with difficulty, especially for the last twenty-four hours, and yet not with the pain which the condition of the penis would indicate. He stated that he was married and had children; that a fortnight back he had sexual intercourse, and that during the act of coition he felt very much pain in the penis; that the pain had continued, in some degree, from that period; that the organ remained since in a partial state of priapism; that a discharge appeared a few days after connexion; that he had an attack of gonorrhœa heretofore, and that his present symptoms were quite of a different character; and that previously to this attack he never had any urinary irritation. He had a swell-

ing of the scrotum for some years, which, on examination, I found to be a large hydrocele of the left tunica vaginalis. Whilst ascertaining the nature of this hydrocele, I felt a fulness and hardness, perfectly circumscribed, immediately in front of the scrotal portion of the urethra. It was rather more prominent on the left side than on the right; was about the size of a large almond, and, when pressed, increased the urethral discharge a good deal. The tumour was not very painful to the touch, and there was a total absence of any implication with it of the surrounding areolar tissue of the scrotum. There was no constitutional disturbance of any amount. For a few days the treatment was palliative. The full condition of the penis had somewhat subsided, and micturition was tolerably free. I tapped the hydrocele, and removed fluid of the ordinary character to the amount of about ten ounces. On now examining the tumour above alluded to, a peculiar crackling sensation, somewhat coarser than that of emphysema, was communicated to the fingers; and on passing a director down the urethra it clinked against a solid obstruction in the seat of the swelling. Beyond this the director could not reach. I cut down on the tumour and exposed the hard substance alluded



FIG. 10.—Calculus removed from the Urethra.

to, which turned out to be a calculus, exactly of the form and size delineated in the woodcut. A full-sized catheter was passed into the bladder, and secured,

and after forty-eight hours it was removed. A very small quantity of urine escaped through the wound for a day or so, but within a fortnight the man left hospital well, without the intervention of any unpleasant symptom.

The appearance of the calculus in this case, its size, its shape, and its composition, are points of much interest for consideration. The roughened surface and the peculiarity of that roughness, are so truthfully delineated by Mr. Oldham in the woodcut, that their examination with a magnifying-glass can be fully depended upon as faithful representations. They give the idea that the calculus originally consisted of distinct aggregated masses, which ultimately coalesced and became consolidated. When recent they were spangled over with minute sparkling and transparent crystals, especially evident if viewed with the naked eye by the reflected rays of a bright sun. Under a glass nothing could be more beautiful, some being in tufts, others again as if involuted, and others irregularly scattered over the surface. Those crystals were oxalate of lime, and the composition of the calculus throughout was the same, intermixed with lithic acid and lithates. There was no phosphatic coating traceable, and the acid characters of the urine, accurately noted throughout the progress of the case, justified the anticipation of the absence of any, at least in excess. The shape of the calculus fairly stamps upon it a renal origin; and it would appear not unreasonable to assume that its transit to the situation from which it was excised was rather rapid.

CASE XLII.

Obstruction of the Urethra of a Child by a Calculus.—Alternating Attacks of Retention and Incontinence of Urine.

A fine boy, aged between three and four years, had been latterly observed by his playmates, when in the midst of his amusements, suddenly to throw himself down on the ground and grasp his penis, when his urine squirted out with great force and apparently with great pain. These attacks occurred at irregular and sometimes at very lengthened intervals, and were occasionally so transient that the boy quickly resumed his play. The symptoms became more frequent and more urgent, and latterly ended in temporary retention or incontinence of urine. After ordinary means had failed to relieve him in one of these attacks of retention of urine, he was brought to the Netterville Institution. The bladder was fully distended with fluid, and nothing abnormal was discernible along the tract of the urethra. I transferred him to the hospital, and, introducing a silver catheter, distinctly felt the sharp clink of a calculus when the bladder had been nearly emptied, and again when withdrawing the instrument. On no subsequent occasion could I satisfactorily feel the stone, either with a sound or with Civiale's child's lithotrite, yet the symptoms above noted again and again recurred, and in the absence of any other ostensible cause to produce them I felt convinced that a calculus was in the bladder. I now accidentally remarked that there was a subsidence of the more intense suffering during

the presence of incontinence of urine, *not the effect of retention*, and during it I determined to test the urethra. It struck me that then the calculus might occasionally pass into the membranous or prostatic portion, and become more or less fixed there, changing its locality

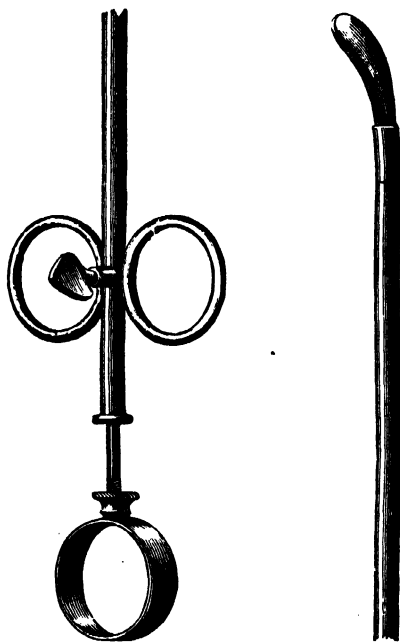


FIG. 11.—Forceps for removing Calculi from the Urethra.

according to the position of the child or the condition of the bladder. I had some time previously devised the forceps outlined in the preceding woodcut, with the special object of catching small vesical calculi in the neck of the bladder, or in the commencement of the urethra in children. I selected it in the present

instance, and placing the child before me in the semi-recumbent position, slowly introduced it, and felt the stone in or about the membranous portion of the urethra. I now gently withdrew the instrument a little, and, cautiously opening the blades, kept them steadily fixed in my left hand; then passing the fore-finger of the right within the anus, I approximated it to the forceps, and fixing its tang with the thumb-screw, I caught the stone and withdrew it, as in the woodcut. There was some slight bleeding from the urethra, but it quickly subsided. Suitable treatment was directed, but next day a train of symptoms was reported which gave me much alarm. That there should have been some slight tenderness of the urethra, and pain in micturition, and some slight bleeding, I expected, but a very formidable-looking swelling of the scrotum and penis was now superadded, which had increased to so great an extent within twenty-four hours, that the former was of a vivid red colour, tense and shining, and painful to the touch. The perinæum was also somewhat full. There was yet not much constitutional disturbance, and the urine escaped in a good stream and in fair quantity. By repeated tepid ablutions, by the use of diluted drinks, farinaceous diet, and some mild cooling medicines, all swelling subsided, and perfect cure rapidly advanced after the lapse of a week.

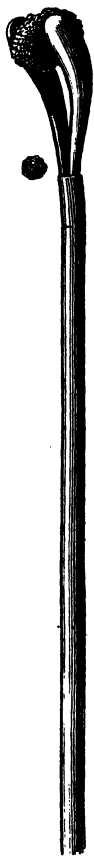


FIG. 12.—Forceps in use.

Chance, it may be said, directed the calculus into the forceps in the above case, and unquestionably a chance thought suggested the trial of the instrument. But there is here a practical hint to the surgeon as to the means he should adopt in cases of this kind, where an accurate differential diagnosis can be established as to the size and site of a calculus, in the commencement of the urethra of the child. The direction and shape of the bladder at that period of life, and the conformation of its neck; the great capability for dilatation of the adjoining portion of the urethra, and the very slight development of the prostate gland, all tend to facilitate successful manipulations there, to the exclusion of any capital operation, which is so highly objectionable under the circumstances I allude to. The length and calibre of the instrument I recommend for this purpose is adapted to the urethra of most children about three or four years of age; and its introduction into the bladder is an operation of the veriest simplicity. Its shape, moreover, suits it to the special offices it has to perform. All surgeons conversant with the several appliances in urinary surgery will recognize it to be no more than that modification of Hunter's urethral forceps, in which the tang and blades are slightly curved, and rendered somewhat conical at the end in order to facilitate the attainment of the object contemplated. Indeed, with the tang and forceps straight, which can when required be substituted for the curved, this instrument appears to me to be better suited for the removal of urethral calculi than the several varieties of the

French urethral forceps which I have met with, and much better than the articulated scoop of Bonnet. This latter, however applicable it may be in certain cases to the adult urethra, is not free from great risk of lacerating it in the child. An additional advantage derived by making the forceps curved, as I suggest, is that it may answer as a sort of staff, to cut down on any part of the urethral tract, and so excise a calculus should its size or any other contingency prevent it from being fully withdrawn from the urethra.* Moreover, the tang working within a canula of fixed calibre, and the separation of the forceps blades being placed in a lateral direction, tend to correct many difficulties which are often encountered at the orifice of the urethra when the ordinary forceps is used, and within the urethra when the blades of the forceps or lithotrite are placed in opposite directions. A urethral lithotrite, as usually constructed, must in most instances fail utterly in catching a calculus; in all, must produce severe injury of the urethra, and in many must propel the stone towards or into the bladder.

CASE XLIII.

Obstruction of the Urethra of a Child by a Calculus.—its Escape and Arrest under the Prepuce.—Retention of Urine.—Inflammatory Phymosis.

A wretched-looking boy, aged seven years, was carried to hospital in great pain from urinary distress.

* This instrument was manufactured by Messrs. Thompson & O'Neill, Henry-street.

According to the statement of his mother, he had been a week thus suffering. His first symptoms commenced with frequent urgent and most painful micturition; and he absolutely screamed when the last drops of urine were escaping. This fluid was frequently mixed with blood; he had not slept for more than forty-eight hours; he was constantly pulling and dragging the penis; and he was so unbearable from his cries, that he was dismissed from an hospital in which he had been for some days. I at once admitted him into the Richmond Hospital. On examination I found he had inflammatory phymosis, and I learned that it had made its appearance within the last two days. The inflammation extended along the body of the penis, and involved the anterior part of the scrotum. The bladder was tensely full of urine, and the boy was absolutely prostrated by his suffering. He was so irritable and unmanageable that I at once put him under the influence of chloroform, and examined along the urethra for the presence of a calculus which I suspected. From the congested and cedematous condition of the prepuce, I could with difficulty find the orifice of the urethra, yet I drew off with a silver catheter between five and six ounces of urine, free from any appreciable amount of blood, and with acid reaction. A warm hip-bath and ordinary soothing treatment were directed. Next morning I found the boy had spent a comfortable and quiet night, had passed water, and was free from suffering. The scrotum and body of the penis were much less swollen and the prepuce softer. I again put him under

chloroform, and, feeling some hard body within the contracted end of the prepuce, was proceeding to introduce a probe to test its nature, when with gentle compression a lithic acid calculus of bright brick-red colour, and somewhat larger than a hemp-seed, became visible and was easily removed with the finger.

The main suffering of this boy now disappeared, and there was no longer agony or frequency in micturition. There was some pain when the last portion of the urine escaped, but I am disposed to attribute this to the inflammatory condition of the prepuce, and to some internal excoriations accompanying it.

The case, so far, is a good illustration of the arrest of a calculus under the prepuce in its transit from the urethra, and evidences the local effects which it may give rise to.

CASE XLIV.

Obstruction of the Urethra of a Child by a Calculus.—Retention of Urine.—Apparent Injury to Urethra during Escape of Calculus.—Subsequent acute Inflammation of Scrotum.

A child, aged between two and three years, was brought to the Netterville Institution, with the scrotum of a bright-red colour. Its surface was smooth and glossy, intensely swollen and œdematous, and had a uniformly solid resistant feel when compressed. The integuments of the forepart of the penis were

slightly infiltrated with serum to the end of the prepuce; the perinæum was soft and natural though very sensitive to the touch, and the urine had latterly escaped freely, but with apparent pain as it coursed along the urethra. From the mother's account, this swelling of the scrotum had rather suddenly occurred within twenty-four hours, the child having had immediately beforehand a "stoppage in his water," during which he forced and strained, when, after a bath whilst stuping him, she felt a small gritty particle at the orifice of the prepuce, and removing it gave relief to all his sufferings. The gritty material which escaped was a small roughened mulberry calculus, not much larger than an ordinary duck-shot. By tepid bathing, by ensuring subsequent dryness, and by mild alkaline treatment, the swelling of the scrotum and penis subsided at the end of a week without any untoward result.

Such cases speak for themselves; and I apprehend that they often escape observation in practice. Perhaps when we reflect on the physical characters and chemical components of urethral calculi in the child, as contrasted with those met in manhood, we may have some clue to an explanation of the occasional differences in their local effects during their escape.

The following is one of the most interesting and instructive cases I have ever met with, and especially

so on account of the age of the little patient, and the practice it inculcates. I therefore state it, with the notes of its progress to cure, somewhat in detail.

CASE XLV.

Obstruction of the Urethra of a Child by a Calculus.—Rupture of Urethra behind Calculus.—Extensive Extravasation of Urine.—Removal of Calculus through Orifice of Urethra.—Recovery without Suppuration or Slough.

A boy, in ordinary health, and aged under two years, was observed for some days to be uneasy and uncomfortable in passing his urine. During the act he cried, and so constantly applied his hand to the penis that he was being repeatedly corrected for so doing by his mother. On Thursday evening, the prepuce being reddish and swollen, and his sufferings not diminished, he was carried to an adjoining medical establishment. Medicines were directed with a view to relieve him, and during Friday not much alteration took place in his symptoms, beyond somewhat of increased suffering during and after micturition. On Saturday, for the first time a considerable swelling of the penis and scrotum attracted attention, and now complete retention of urine took place. Under these circumstances I was sent for on that day, about three o'clock, p.m., to visit him. The description of the sufferings of the child cannot be exaggerated. He was perfectly prostrated from their prolonged intensity. His countenance was sunken and pallid; the

surface of the body clammy; his pulse to be counted with difficulty; and he was writhing with fruitless and repeated efforts to pass water, not a drop of which escaped externally. He could only lie on his back with his legs and thighs widely separated, almost at right angles with the pelvis, in order apparently to protect the scrotum and penis from the slightest touch of even the clothes. All the formidable local appearances of urinary extravasation from ruptured urethra, as in the adult, were present: the integuments of the penis were largely distorted and distended; the scrotum was absolutely almost bursting from tension, and a light pinkish blush pervaded both throughout. Any special examination was totally out of the question, from the extreme tenderness present. The child was almost frantic with pain, which was at intervals lulled by the intervention of a sort of semicomatous stupor; not a drop of urine had escaped for many hours, and the bladder was fully distended. To examine the child satisfactorily I at once placed him under the influence of chloroform, and ultimately came to the conclusion that the case was one of urinary calculus impacted in the urethra, that the urethra had given way behind it, and that not a moment should be lost in the removal of the calculus and the relief of the retention of urine. The outline of the bladder could be traced extending up to the umbilicus; the perinæum was full but not tense; the transverse width of the scrotal portion of the penis was considerable, and was hard to the touch; and not a doubt could be entertained as to the pre-

sence of considerable effusion of urine, communicating an œdematous and semicrackling feel along the cords and inguinal canals. The distorted state of the prepuce and its small aperture would not admit of the entrance of more than the finest probe-director; and it was impossible to find the orifice of the urethra, or even to trace the outline of the glans penis. I had no alternative but to slit up the prepuce. Having done so, I was surprised to see to what a depth the glans had sunk, suggesting the idea that the body of the penis was as if abnormally drawn back towards the pubis. The distance was unquestionably more than an inch from the natural site of the opening in the prepuce; the orifice of the urethra was a mere pin-hole, and on passing a probe-director into it to the extent of about three inches, a calculus was audibly struck. I could merely satisfy myself that it was too large to be removed without widening the urethral orifice. I did so freely through the glans in front, when, introducing a forceps, I caught the calculus of the shape



FIG. 13.—Urethral Calculus in a Child.

and size here outlined, and extracted it with some little force. I now found the bladder remained full of urine, and failing in the introduction of a gum-elastic catheter I succeeded with a silver one and drew off not less than a pint of urine. This on examination was found to be clear in colour, acid in

reaction, of a density between 1018 and 1020, devoid of any morbid odour, and loaded with lithic acid crystals.

The effects of chloroform were now allowed to pass off: stimulants of the ordinary class were exhibited, suitable nourishment directed, and soothing fomentations applied. At evening visit about six hours afterwards, I learned that urine had flowed abundantly and continuously through the catheter which had been left in the bladder; that the child had taken freely nourishment which he had hitherto refused, and that his medicines had been exhibited. It was obvious that the scrotum was less full and tense; that the groins and inguinal canals were less swollen; and that the integuments of the penis had also somewhat recovered their natural colour. The child was yet, apparently, in torture from the presence of the catheter. The slightest movement of any kind distressed him; and the requisite fixed position of the instrument, almost necessarily at right angles with the pubis, only tended to increase his misery. No change in the direction of the catheter could with any safety be contemplated; so that under all the circumstances of the case I thought it prudent to remove it and chance the result. Next morning I had reason to regret this step, as no urine had been passed during the night. Again the bladder was full; and the penis, scrotum, and perinæum were more swollen, and most decidedly they were more painful and discoloured. Chloroform was again had recourse to and with very satisfactory results. I luckily succeeded in introducing a gum-elastic

catheter (No. 4); relief was immediate; the bladder was emptied; the catheter secured in it; and the urine allowed to flow uninterruptedly. Hours of natural sleep followed; proportionate improvement in the general symptoms from day to day, and also a gradual subsidence of the local took place, without the necessity of any interference beyond that of cleanliness, and the use of such medicines as the nature of the case dictated. Within a week the healthy condition of the penis, scrotum, and perinæum was restored. The divided edges of the wound in the prepuce and the intervening flap were slow in cure, but not a trace of sloughing or suppurative action was to be detected in the site of the extravasated urine throughout the whole progress of the case. Uneasiness in micturition was however to be expected, until the urethra recovered the effects of the serious injury it sustained.

I have been unable to bring to my recollection any case on record similar to the above. Its history teaches a lesson of much practical value as regards diagnosis, and its favourable issue points to a new feature in the treatment of extravasations of urine in the child. Questionable, perhaps, in Case XLIV., before noted, no doubt can for a moment be entertained as to the extensive extravasation of urine in this case, and urine by no means devoid of those physical properties usually productive of serious local mischief. And yet, the result tells how conservative in the child are those tissues which are deemed to be so much the opposite in the adult, under the conditions notified.

The probable effects of the adoption of the ordinary principles of treatment may well be imagined, if had recourse to in the child; and the value of their total exclusion under similar circumstances, as in the case now recorded, may be fairly inculcated.

The almost certain co-existence of retention of urine in cases of this class should never be lost sight of. In the adult it is much less likely to escape detection—in the child it requires much more caution, the commemorative symptoms are so treacherous and so anomalous. This retention of urine must be substantially relieved; it is idle to trifle with it. In the adult considerable difficulties often interfere with the successful introduction of a catheter into the bladder, where the urethra is ruptured, and these are in the child much greater. Indeed the passage of a gum-elastic catheter into the bladder of a child in the perfect urethra is generally speaking difficult; and it is absolute fumbling if a stilet is not used, especially in a case such as that now under consideration. The operation requires a steady, gentle hand, a well-fitting stilet and catheter, a good position of the little patient, and an accurate recollection of the peculiar course of his urethra. With a catheter shaped as in fig. 14 I very seldom fail; and I prefer in the first instance the silver instrument, where difficulties are to be expected. Made as it is, solid and short with an abrupt curve, you have better command over it, you can direct it more easily in its proper course, and if you leave it in the urethra for ten or twelve hours you can substitute for it, with tolerable certainty,

a gum-elastic catheter similarly curved. Whichever you select may be altogether dispensed with after forty-eight or fifty-six hours. Nature has then formed so firm a barrier along the tract of the canal, that its integrity is secured for the discharge of urine.

The mode of removal of the calculus in a case of this kind, is a point of considerable moment. It is really surprising how large are many of the calculi which successfully, and wholly unassisted by art, course surreptitiously through the urethra of the child; nay more, not unfrequently without any marked distress until they are stopped at the external orifice of the urethra or prepuce. And it is also surprising how very freely a well-shaped forceps can be moved about in the interior of the canal, at a great depth, if the orifice of the urethra is so widened as to admit of the working of the instrument. It is the narrowest part of the tract, and it may be freely incised without apprehension as to the result, immediate or distant. I am disposed to think *that the division in front through the*

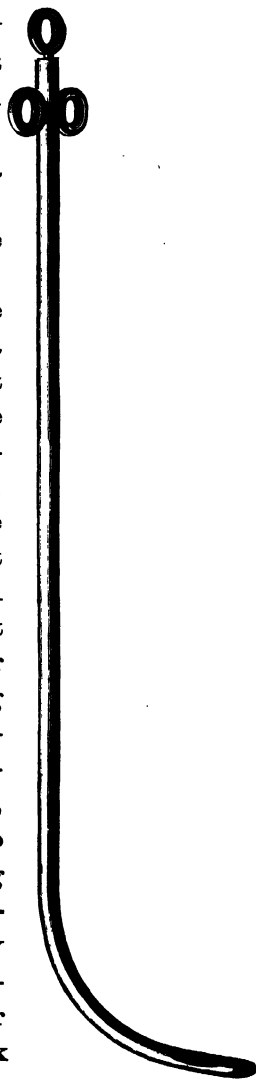


Fig. 14.—Catheter suitable for Children.

glans, is preferable to that towards the *frænum*; there is less mischief done and it is more manageable. I have never met with annoyance from hæmorrhage, and as to any risk of subsequent contraction of the orifice, there is none whatever; the wound heals kindly, and moreover it is not subject to any irritation from the trickling of the urine. I am a warmer advocate for the removal of those calculi by such an expedient, where it is possible to succeed, than to hazard their excision from the urethra. I have done so, however, both in adult and in child, as already noted in some of the above cases, and I have not had any untoward result (see Cases XL., XLI.), that I have been able to learn; but I have met with other cases in which sharp urinary fever with urinary infiltrations and abscess have occurred, and in which unmanageable fistulæ and annoyingly obstinate traumatic strictures have too often impressed the surgeon with the conviction that his treatment should be always guarded and circumspect in cases of this kind.

The urethra often permits fragments of calculi, after the operation of lithotrity, to escape under conditions very unpromising, and this without injury to itself. I have seen very large fragments voluntarily discharged, which for hours, some for days, remained perfectly fixed and immovable. The following is rather an unusual instance, accompanied with decided injury to the urethra:—

CASE XLVI.

Impaction of Fragmentary Calculus, after Lithotrity, in Prostatic Portion of Urethra.—Frightful Hæmorrhage. —Ultimate Escape of Shell of Calculus, with Nucleus.

A carpenter, of very intemperate habits, and aged about fifty-five years, underwent the operation of lithotrity at four different sittings, and was free from any remaining symptoms to indicate the presence of any portions of *detritus* of importance. A quantity had passed off with tolerable ease, proportioned to the measured size of the calculus, which was principally lithic acid and lithate of ammonia combined. He was suddenly attacked with a cutting pain about the neck of the bladder, and a return of painful and urgent micturition. The most violent hæmorrhage I ever saw set in; it was unequivocally urethral, and originated far back about the region of the prostate gland. In a terrible paroxysm of dysuria there was a sudden stop to the blood and urine; the penis became full and turgid. The man directed attention to a large coagulum of blood blocking up the orifice of the urethra. On removing it I found a sharp broken shell of calculus sticking in the urethra, with a nucleus well defined and somewhat larger than an ordinary apple-pippin. All hæmorrhage rapidly subsided; and now, after the lapse of more than three and a-half years, the man continues free from a symptom of his disease.

This case and others I might note prove that the treatment of the surgeon in many such instances should be expectant at the same time that it must be watchful.

I have selected the preceding cases as illustrative of the several sources from which foreign bodies intercepting the current of the urine in the urethra may arise. The minuteness of the details, and the observations interspersed throughout, leave little room for further comment as regards symptoms, diagnosis, or treatment. Specialities in each case will, undoubtedly, be attended with peculiarities of symptoms, and will require proportionately modified treatment. Thus, the effects of the introduction of foreign bodies into the urethra from without will materially differ, not alone as regards the nature of the foreign body, the extent to which it may have entered the canal, and its duration there, but also much according to the healthy or unhealthy condition of the parts engaged. The same remark is applicable to the second class, or the truly urethral concretions, as also to the third, embracing renal and vesical calculi. There is a very great similarity in the rational signs attendant on all cases of this kind; nevertheless distinctive characters are often present, attention to which will greatly assist the surgeon in the selection of appropriate treatment. Case No. XXXIV. is of much interest, both from its complicated character and from the treatment adopted at the different stages of its progress. It is to be much regretted that the subject of it was so unfavourable for the success of any operative procedure. The satisfactory issue, however, of Allarton's operation is worth noting. No perinæum, no urethra could be more unfavourably circumstanced, and yet the steps of the operation were carried through without

any untoward interruption, owing, I am disposed to believe, to the dilatation of the portion of the urethra which was the seat of the operation, as I am rather sceptical regarding the capability of even the most accomplished anatomist to strike the healthy membranous portion of the urethra from the perinæum so very accurately as is asserted, so as not to implicate the bulb more or less. Even in the dead subject it is not so very feasible. I am not aware that Allarton's operation has been performed in this country in any previous instance; I am not by any means satisfied on many points respecting its details; and I acknowledge that I cannot understand how a patient, after its performance, "usually sits up and moves about the following day;" nay more, has been "up and out the day after the operation, and walking out on the third day." I have not met with or seen such results. The operation, however, appears to me worthy of consideration and of trial, in cases where foreign bodies are impacted in the distant portions of the urethra, and perhaps also in the neck of the bladder, or in cases where urethral concretions or small prostatic or vesical calculi occupy the same situation, and are not removable by simpler means.

The second class of these obstructions in the urethra often escapes notice. Urethral concretions are not unfrequent attendants on diseased urethræ, strictured or otherwise; they complicate urethral fistulæ, and certain prostatic diseases. Such concretions may escape detection from the fact that metallic instru-

ments are not so much the fashion now as heretofore, in the treatment of urinary diseases; and with such instruments alone can we satisfactorily ascertain the presence of these calculi. The elastic bougie capped with silver is an excellent medium for the purpose, and also the gum-elastic catheter attached to Wakley's admirable stricture apparatus. In all cases of protracted stricture, whether accompanied with fistula or not, it is well to examine the urethra and the tract of the fistula, if present, with this object; and this is specially important if the morbid condition of the urine usually attendant on such cases do not keep pace with the improvement in the local symptoms. Case No. XXXVII. is a good illustration of this class. Even when the stricture yielded so far as to admit No. 6 and No. 8 catheters, the morbid condition of the urine persisted.

From the peculiarly friable character of these concretions, it is intelligible that they may be crushed by forcible compression, as would appear from the details given in Case No. XXXVI., or with a suitable lithotrite. I find when they are present with stricture, that in proportion as it yields to treatment and that appropriate general remedies are directed, much improvement can be calculated upon, without any operative interference; and especially in the urinary secretion, the healthy state of which must influence the phosphatic deposits present and prevent their reformation, just as we occasionally see, after lithotomy, the wound as if frosted over with phosphatic coatings, ultimately become perfectly freed from them. I have

not had under my immediate care cases in which these concretions reached a large size, and hence I am not justified in noting them here, although I have seen some very remarkable cases indeed. The sensible signs of these urethral concretions are often manifest enough; but I need not dwell on the difficulties which present themselves in a Case like that of No. XXXVII. In such a case accurate diagnosis is of the greatest importance to decide the surgeon as to the suitable operation to perform, if any such be required. The size of the stone—whether it is simply urethral, or urethro-vesical, or a combination of urethral and vesical existing separately, presents difficulties which cannot be exaggerated and are often insurmountable. What cautious surgeon will venture to decide by the sound or staff alone as to the presence of a stone in a bladder, when the urethra contains one stone or many fixed in it?

The last class of these obstructions affords a very interesting field for study, and they are by far the most frequent in occurrence. The cases I have detailed may be commonplace, but it is surprising what carelessness exists respecting their detection. I have seen very distressing results from this neglect, especially in children. The truth is, urinary calculi, both renal and vesical, are much more common in this country than is generally admitted, and especially in children, if we take into account those cases which escape with little or no surgical interference. I feel satisfied that many of the so-called abdominal affections at the early periods of life are attributable to this cause, and that calculi often escape without any

suspicion having been entertained of their presence. The remarks I have made respecting the causes of "Irritable Bladder" in children rather tend to confirm this statement, inasmuch as those amorphous and crystalline deposits, which are by no means then unusual, almost always enter into the composition of their calculi.

As a distinct urinary affection, retention of urine is rare in the child and so is incontinence (except nocturnal); and both are more frequently traceable to this class of obstruction than to any other cause. In every such case the surgeon will err on the safe side, who never omits in the very first instance to examine carefully the tract of the urethra *externally*, in order to ascertain whether a calculus may or may not exist along that canal. This should be done *before* he attempts to introduce a catheter; and then he must exercise the greatest circumspection, not alone as regards the detection of a calculus, but also as to ascertaining the special site which it may occupy. I have some of these calculi not larger than a hemp-seed, passed in infancy and in childhood, after a temporary attack of retention of urine, without the necessity of any surgical treatment. It is by no means unusual to find incontinence of urine produced by the same cause. In every such examination a silver catheter is to be preferred. I have observed the greatest bungling from the use of the gum-elastic; and I need not add that any test by it is often fallacious. I have not unfrequently seen a surgeon (a catheter-expert *par excellence*) completely fail in the introduction of such a catheter into the bladder of the child. One will take

an ordinary catheter, probably, of suitable calibre and of ordinary length, with a stilet and then without a stilet, and ultimately fail after torturing the unfortunate patient. My opinion is that a special catheter for such purpose should have a place in the surgeon's armamentarium.

In the adult the difficulty of diagnosis is not so great as in the child, and yet even here caution is required. Case No. XLI. is as remarkable as it is interesting. That so large and so irregularly-shaped a calculus should have passed from the kidney, without producing any symptom sufficiently distressing to attract attention is somewhat strange. Pathology, however, teaches us how very deceptive all symptoms of urinary diseases are. Renal diseases will simulate vesical, and *vice versa*; and urethral disease is often similarly equivocal. I have renal calculi in my possession which were accidentally discovered after death, and where not a sign of their presence was manifested during life, the patients dying from diseases altogether apart from urinary; and I have numerous vesical calculi which passed through the urethra with very little interruption to the urine, and no symptoms worth noting in the bladder, until they reached the urethra. The capacity of the urethra and its tolerance to permit their free transit are often surprising. Commemorative symptoms in all these cases are most important to attend to.

But the difficulties attendant on the differential diagnosis of many of these cases are often as perplexing in the adult as in the child; the principles of treatment,

however, must be influenced by contingent circumstances. In the child, no matter in what portion of the tract of the urethra the calculus is arrested, the sooner it is removed the better. I have sometimes turned it out from the fossa navicularis, which is no unusual situation to find it, and I have never experienced any annoyance from freeing the orifice of the urethra for the purpose if such was required. As in Case No. XL. I have pressed a calculus forwards in front of the scrotum when situated behind it, and I have excised it without any bad result, always adopting the provision of a catheter in the bladder for some hours afterwards. I have also removed a calculus nearly as large as a nutmeg, situated in front of the bulb in a child, through the perinæum, without any subsequent mischief of extravasation or fistula.

Yet it cannot be concealed that most unmanageable if not incurable fistulæ are often the result of such operations. I am inclined to think that this arises from allowing the calculus to remain until a condition of urethra is established which prevents healthy reparation by the adhesive or plastic process, and that such disposition is at once corrected by *prompt* removal. Apart from this consideration I would say that, particularly in the child, when a calculus occupies the perinæal portion of the urethra, there is a very great disposition to its retrograding towards or into the bladder in the paroxysms of urinary distress which almost necessarily attend it, and that such risk should be avoided. Under the influence of chloroform I have seen, during one of these

paroxysms, a calculus suddenly recoil into the bladder, and as suddenly dart forward to its former locality. This is a contingency to which no patient should be subjected. In the distant portions of the urethra difficulties will arise as to the special site of a calculus, particularly if that calculus has been located there for a lengthened period. The sensible and indeed the rational signs of such are so conclusive, that few surgeons of any practical tact can be deceived. An excellent case of this kind has been recorded in the first volume of the "Dublin Hospital Gazette," new series. I assisted at the operation, and had a section made of the calculus. The accompanying woodcut is a representation of the divided surface.

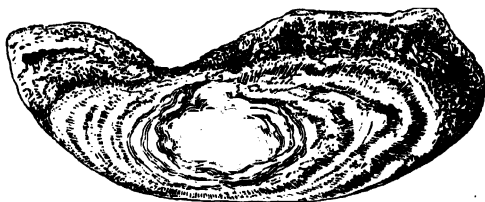


FIG. 15.—Section of a Calculus removed from a child's urethra.

The appearances prove it to have been originally a small calculus of the ordinary composition in childhood, which had been arrested in its passage from the bladder in the membranous or prostatic portion of the urethra, and which had reached its large bulk by successive calculous depositions.

What years of misery would not this child have been saved had an accurate and early diagnosis been formed

CASE XLVII.

Retention of Urine from Calculus in the Urethra of a Child.—Removal of the Calculus from the Bladder through the Urethra.

A little boy, under two years of age, was carried to the Richmond Hospital, having been suddenly attacked with retention of urine after suffering from painful and frequent micturition for a few days previously. At the time of his admission he was forcing and straining to pass water. The bladder was distended as an oblong tumour reaching from the pubis to the umbilicus; the penis was in a state of partial erection and the child was pulling it most violently. I at once suspected from the peculiar character of its symptoms, that there was a calculus impacted in the neck of the bladder or in the urethra, and having satisfied myself of its most probable situation, whilst relieving the retention of urine with a silver catheter I quickly dilated the urethra, and providing myself with a special forceps I was fortunate enough to catch the calculus. I exhibited the forceps and the calculus fixed in the blades, at a meeting of the Pathological Society in July, 1868, and remarked upon the value of the early detection of a calculus of such a size removable by so simple and efficient an operative expedient. I stated that in many instances I had removed calculi from different portions of the urethræ of children, but that in none did I remember a case in which a calculus caught *within*

the bladder was with so much facility removed. Though by no means favourable to the operation of lithotrixy in children, I had yet provided myself with a plain-bladed lithotrite of Charrière, which I proposed using had I failed with the forceps in the case under observation. The calculus removed was somewhat larger than a duck-shot, slightly roughened on its surface, and consisted wholly of lithic acid. It is shown in fig. 12, page 150. It was obviously renal in its origin, and from the accompanying characteristic symptoms it tended to confirm the opinion I had often inculcated, namely, that many of the abdominal sufferings so common in infantile and in child-life are attributable to the unobserved escape of calculous concretions from the kidneys and bladder. I stated that I had found in the kidney of the foetus in utero and sometimes in that of the infant and of the child, small gritty particles consisting of the oxalate of lime or of lithic acid crystals impacted in the tubular structure. I especially directed attention to the remarkable dilatability of the urethra at this early period of life, exhibiting very large calculi which had escaped without the interference of the surgeon up to the orifice of the urethra.

CASE XLVIII.

Obstruction of the Urethra within the Canal.—Calculi encysted in Prostate Gland.—Eccentric Atrophy of Gland.—Hypertrophy of Bladder.

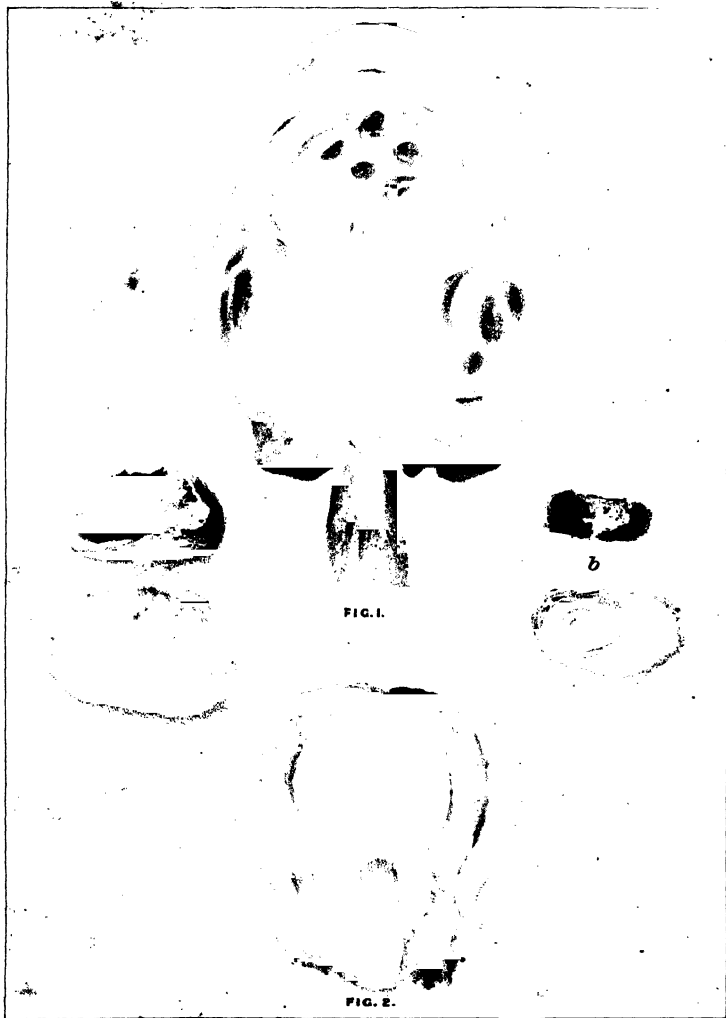
A countryman aged between forty and forty-five years, whose habits were intemperate, had been in hospital for many months, labouring under every complication of urinary disease, such as stricture of the urethra followed by a succession of urethral abscesses terminating in urinary fistulæ, some scrotal, others ante-scrotal, others perinæal, and others on the anterior and upper part of each thigh. There had, moreover, been one near the root of the penis, which was traceable under the arch of the pubis. This man referred the origin of his ailments to a neglected gonorrhœa which had been very protracted, and which was never in his opinion cured. His latter suffering he referred to injury from the introduction of instruments into the urethra, which he said had never reached the bladder. His constitution was now completely shattered from almost persistent fever. Fœtid urine was incessantly escaping from the several urinary fistulæ, and his whole condition was most loathsome. Little or no urine escaped through the orifice of the urethra, and the perinæum was an irregularly excoriated and hardened mass of disease. This morbid condition extended along the urethra towards the neck of the bladder, as indicated by examination through the rectum. At this time the outline

of the prostate gland could not be satisfactorily felt. Under these circumstances he applied at hospital and was admitted under my care. After many interruptions from repeated attacks of the ordinary urinary fever during the treatment of stricture, the urethra at last was capable of admitting with freedom No. 6 gum-elastic catheter, and many of the urinary fistulæ had closed. There was, moreover, a tolerance of the presence of a catheter in the bladder, and great improvement in its functions and in the character of the urine. The catheter was now only occasionally introduced, when a new feature was superadded, namely, the sudden interruption to the stream of urine as it freely escaped from the bladder and a renewal of the excitability. A No. 6 metallic instrument was introduced for the first time, when a distinct grating was felt as it entered the bladder and as it was being withdrawn from it. The sensation was a continuous one, as if the substance felt was fixed underneath. The finger in the rectum rendered this more evident, but neither one nor the other was steadily persistent. The urethra would not bear the introduction of a larger instrument or further dilatation without resenting it, so that I was obliged to desist. I now introduced a grooved staff of similar size, and reached the bladder with some little interruption from the distinct click of a calculus at its point, and the same sensations of friction from its to-and-fro movement. Allarton's operation was decided upon; it was performed in the ordinary manner; the structures divided were hard and unyielding, but yet there was sufficient

to pass a medium-sized forceps into the bladder when the calculus marked *a b* was removed (Plate IX.) On withdrawing the forceps, a sensation was communicated as if other calculi or portions of calculi existed in or about the prostatic portion of the urethra. The greatest difficulty was experienced in catching them, from the manner in which they were isolated; and it was only by varied manipulation that some smaller calculi were removed. With the finger introduced into the wound a point could be felt here and there, but the seizing of more was not effected. A *canule en chemise* was passed into the bladder, and on the second day two other small calculi presented themselves in the deeper part of the wound and were removed. The man recovered slowly, and ultimately left hospital materially relieved, but with a single urinary fistula in the perinæum, through which urine escaped during the act of micturition. I lost sight of him for many months, until one day he presented himself at hospital almost "in articulo mortis" from acute capillary bronchitis. He did not survive his admission more than twenty-four hours; and with difficulty I obtained the bladder and back part of the urethra. There is nothing remarkable in the preparation as regards the condition of the bladder. The appearances are such as are present in almost every case of obstructed urethra, *viz.*, diminished capacity, hypertrophy of muscular coat, and evidence of chronic cystitis. The condition of the prostate gland is specially interesting and instructive. Its structure, almost if not wholly atrophied, presented a loose open cellular basement, in which some calculi were

encased, visible in the drawing and preparation now, but only fully so by enlarging the apertures which existed on their urethral aspect. Other cells contained no calculi and were perfectly patulous. The difficulty to be experienced in the removal of such encapsuled calculi in the prostate gland by any operation must at once attract attention.

The preparation from which this drawing was taken is in the Museum of the College of Surgeons.



MR FLEMING

ON CALCULI IN THE BLADDER AND ON CALCULI IN THE

EXPLANATION OF PLATE IX.

Fig. 1. represents the bladder of a man whose symptoms are described in Case XLIX., page 181. The thickened walls and five calculi lying in the bladder are well shown. The prostate is enlarged and bulges from its tightened capsule after division. The portion of the urethra in front of the gland is ulcerated, and there is a sloughing hole leading upwards and backwards between the prostate and the rectum.

Fig. 2. (Case XLVIII.) shows hypertrophy of the bladder, with eccentric atrophy of the prostate. A number of saccules are represented holding calculi.

(*a.b.*) Calculi removed by operation in preceding case, with sections.

CHAPTER V.

OBSTRUCTION OF THE URETHRA FROM AFFECTIONS OF THE PROSTATE GLAND.

THE affections to which the prostate gland is subject are numerous, but the most common is that known as hypertrophy. When the urine is partly or altogether obstructed in its flow, the utmost care and attention are demanded. The hope of giving relief by the catheter is not always fulfilled, but the attempt to do so must be carried out with a due estimate of the difficulties to be overcome, and the delicacy of the parts involved. False passages are not infrequent, or the gland may be so bruised in the effort to reach the bladder that acute inflammation of it may be set up with all its unhappy consequences.

The cases which follow illustrate some of the affections to which this part of the urinary apparatus is liable.

CASE XLIX.

*Enlargement of the Prostate Gland.—Retention of Urine.—
Acute Suppurative Orchitis.—Calculi in the Bladder.—
Death.*

A stonecutter, aged sixty-eight years, was admitted to the Richmond Hospital suffering from retention of urine. He had been subject to such attacks, apparently from occasional excessive drinking, but in the present instance his symptoms had been marked for about a fortnight and had demanded the use of the catheter. When admitted there was complete retention of urine; and there was a purulent discharge from the urethra, the orifice of which was red, swollen, and painful. The urine was alkaline, foetid, and turbid, the skin dry, and the tongue dry and furred. For a time he improved and was able to pass water himself; but about a fortnight after his admission he got an attack of acute orchitis on the left side, and from this time he gradually continued to sink. The *post-mortem* examination revealed a contracted bladder, with greatly-thickened rough walls. The prostate was enormously hypertrophied (Plate IX.), particularly in that portion which lies in front of or above the urethra. The gland was tightly embraced by its capsule, so that when divided the cut surface bulged and became convex. The substance was dense and yellow. The middle lobe was large, and Guthrie's bar was well marked, with a large pouch behind it. Lying in the bladder were five calculi, varying in size from a large pea to a marble. They were spherical

in shape, and composed of alternate layers of lithic acid and lithate of ammonia. The urethra was healthy until it arrived at the anterior portion of the prostate. Here the inferior and the two lateral walls were destroyed by ulceration, and a large sloughing hole was visible leading upwards and backwards between the prostate and the rectum, as high as the opening into the bladder. The left testicle was enlarged, and on cutting into it the normal structure was found to be almost completely destroyed, its place being occupied by two abscesses. The remaining portions of glandular tissue were very vascular. (Plate VIII., fig. 1.)

CASE L.

Retention of Urine from Prostatic Enlargement, with Hydrocele.—Death.—False Passage.—Growths in the Urethra.

A man, aged eighty, was admitted in a state of great prostration, the surface being cold, the lips congested, the pulse weak, irregular and intermittent. The scrotum was swollen and red, and the patient complained that he had been unable to pass urine for a considerable time. A large-sized catheter was introduced without difficulty, and the bladder emptied of a pint and a-half of somewhat foetid urine. The man had previously suffered from retention, and had been treated by a surgeon who had failed to introduce an instrument. He was brought to hospital, where, a large hydrocele having been tapped, he was relieved

of the contents of the bladder. The patient went home, but the tunica vaginalis quickly filled again, became red and painful, and he only presented himself when his state was such as has been described. The bladder now required to be relieved three times a day. The urine was foetid, and gradually the typhoid symptoms increased until death occurred, a week after the patient's admission.

The *post-mortem* examination revealed universal pleural adhesion, and obliteration of the pericardial sac by the same cause. There were bony deposits in the sigmoid valves of the aorta. The bladder was contracted, thickened, and with a red, rugous, mucous membrane. The prostate was hypertrophied, especially in that portion lying above the urethra. Its cut surface presented a tubercular appearance. From the lining membrane of the prostatic portion of the urethra sprang several out-growths; two were each about the size of a kidney-bean, pear-shaped, with the small end turned forwards. That in the right side contained a small cyst; the other was partially perforated by a false passage. The middle lobe was somewhat enlarged. The urethra was rendered tortuous in its prostatic portion by the growths described. Just at the commencement of this part of the canal there was a bridge apparently formed by a portion of mucous membrane raised by the catheter from the floor of the urethra.

The difficulties the surgeon has to contend with occasionally, in relieving a person labouring under re-

tention of urine from prostatic disease, are often considerable, and especially so if any fruitless attempts have been made previously to his visit. Independent of the agonizing paroxysms which the patient suffers in his efforts to empty the bladder, the penis is often in a state of much congestion or semi-erection, the urethra bleeding or filled with semi-coagulated blood; and even if he be fortunate enough to reach the bladder in his first effort to introduce a catheter, the surgeon is mortified by the fact that not a drop of urine escapes; yet he is satisfied that the instrument is in the bladder. He removes it reluctantly, and finds that it is so completely clogged with coagulated blood that a drop of urine cannot escape, and then, if a gum-elastic, he has the misfortune to fail in replacing it with the same facility, and is obliged to use a metallic instrument, which by no trifling management he succeeds in introducing. The urine comes with a violent spasmodic effort of the bladder, in the first gush giving vent to lengthy thin coagula of blood, the remainder being ordinary-coloured urine.

I may mention a case in point which occurred to me lately.

CASE LI.

Enlarged Prostate.—Retention of Urine mistaken for Suppression.—Fatal Result.

A gentleman of full habit, aged fifty-eight or so, was suddenly attacked with retention of urine, the result of exposure to cold after taking medicine. Pre-

viously, the only remark he could make respecting the passing of his water was, that it escaped more slowly than usual, and that there was an occasional frequency but no more. Retention suddenly occurred, accompanied with the ordinary symptoms. A gum-elastic instrument was introduced by his usual medical attendant, but no urine escaped and some bleeding ensued. The case was now treated as one of suppression of urine. Symptoms of *retention* became more urgent, and unsuccessful attempts at introduction of an instrument were made. After nearly thirty-six hours of torture advice from town was sought, and the case was at once recognized as one of retention from enlarged prostate gland. On proceeding to introduce a gum-elastic instrument, I observed bleeding from the urethra, and the canal was matted together with coagulated blood. About the membranous portion a false route was felt, into which the instrument passed. I withdrew the catheter and passed an ordinary silver instrument, when, although the first was bloody, a wash-hand basinful of ordinary urine escaped. On the following day the gentleman in attendance succeeded in introducing a silver catheter and drawing off the urine, but again failing I was called on. I found that the patient had just reached town, a distance of four or five miles, in great agony. The bladder was distended above the pubis, as tense as a drum, the penis full and blood oozing from the urethra. I felt the perinæum and examined the prostate, which was enormously enlarged. I now took a gum-elastic catheter about No. 12 size, with a steadily-fixed stilet of

brass wire, and curved of an ordinary prostatic shape, and without the slightest force it almost slipped into the bladder. I was fully satisfied it was in the cavity. I withdrew the stilet, but not one drop of urine escaped. I made every manœuvre without success. I was obliged to remove the instrument, when I found it filled with blood from one end to the other. Having cleaned it I attempted to reintroduce it, but I found it did not pass so easily, and that it hitched over some irregularity about the bulbous portion of the urethra. Again I removed it and substituted a silver catheter of the same size but shorter curve, when it passed into the bladder, giving exit to a large quantity of urine free from mixture of blood, except at the first gush. On withdrawing the instrument I substituted a catheter, and intended to tie it in the bladder; I however thought it more prudent, under the circumstances of the case, to wait until morning, as the urethra was beginning to feel tender and any pain felt was referred to it. Next day I resigned the case to the surgeon who had visited it in the country, and I learned he passed a gum-elastic catheter into the bladder, and fixed it there; and that the ultimate result was fatal.

In these cases I always make use of a small india-rubber enema bag, with a fine nozzle adapted to the diameter of the top of the catheter. On the occasion referred to it was unfortunately not available. I use the bag for clearing the catheter of blood clots while it is still in the bladder. This is effected by compressing

the bag so as to expel all air; the nozzle is then fixed into the catheter, and the bag suddenly allowed to expand. By this means the coagula are drawn out of the tube. If, however, this proceeding fails, a little air injected into the catheter by the same means may clear the eye of the instrument.

In some instances a difficulty occurs which is often embarrassing, if the surgeon is not on his guard. It presents itself more frequently, perhaps, in persons who are corpulent, with a large pendulous abdomen, and considerable fatty accumulations over the pubis. An attempt is made to introduce an instrument without a stilet, and fails. A catheter armed with one is had recourse to, with a like result. The instrument is withdrawn, probably tinged with blood, and the surgeon is called in. He sees the difficulty—probably has observed the attempt at introduction of the catheter by the attendant. The curve may be the proper one, and the necessary adjustments may be perfect. The instrument is at once introduced by the consultant. He has seen the mistake made, which consisted in not passing the catheter fairly down to the perinæum. The deception arose from the great depth of the parts, and the too sudden depression of the hand, thus tilting the tip of the catheter against the pubis. If the surgeon uses violence he ruptures the urethra, and perforates the corpus spongiosum or the corpus cavernosum, and in either case death may result.

Cases occasionally arise in which after failure with the ordinary instruments, the bladder may be reached by means of a vulcanised india-rubber catheter. It is

introduced without a stilet, and slowly wormed through the urethra. It adapts itself to the shape of the canal, and is so supple that the patient can move about with it in his bladder, without suffering any irritation. In other cases, a stilet must be introduced, of the shape suitable to the special obstruction. It is necessary to see, however, that the stilet is pressed down to the extremity, and so secured at the proximal end as to prevent any possibility of its recoil. Both stilet and catheter should be well oiled before being used. I may here make the general observation upon the importance in all cases of catheterism of examining the condition of the stilet before introducing the instrument: the wire is very often allowed to become rusty and encrusted, and the canal of the catheter to be partially blocked. The wire should not be passed in until it is quite clean and smooth, and this is best done by means of a little sand-paper and chamois. This is a rule which also applies to all canulæ, for I have seen some awkward surgery result from inattention to these details in tapping hydroceles and the bladder, the trochar being almost immovably fixed in its sheath.

In the treatment of simple hypertrophy of the prostate gland a great deal may be done to palliate symptoms; but my own experience does not favour the hope of any absolute diminution of the size of the gland. The great object of the surgeon is to relieve the retention of urine attendant upon these cases, and to direct his attention to the removal of such causes, sexual, dietetic, or accidental, as are

likely to produce temporary local congestion. With a view to removal of the hypertrophy, a great many remedies have been tried, local and general. I have myself given an extended trial to iodine, alone, and in combination with the several salts of potash, but in no instance has there been any improvement in the condition of the gland, or in the alleviation of the symptoms referrible to its enlargement. We must, however, endeavour to maintain the tone of the bladder so as to enable it to discharge its contents satisfactorily; and in addition to the ordinary general tonic treatment I have no hesitation in recommending the liquid extract of ergot and the local use of the electro-galvanic machine, applied to the sacral and hypogastric regions.

Notwithstanding what is stated by writers on prostatic disease at a very late date, acute inflammation of the gland is a rare affection—very rare indeed when we consider the many causes which may produce it,—compared with the frequent occurrence of gonorrhœa, and the repeated and careless introduction of instruments into the bladder. The diagnostic symptoms of the attack are not sufficiently attended to at its commencement, and hence treatment is not successful.

There is a form of inflammation of the prostate gland which deserves special attention, and special interference on the part of the surgeon, neglect of the treatment suited to it being productive of most untoward results. I allude to a deep-seated suppuration on its urethral aspect, commencing with acute symptoms, and bursting into the urethra alone, or also into the

rectum. Any local irritation may occasion it. It may arise from gonorrhœa, from pseudo-gonorrhœa, from the introduction of a catheter, from sexual intercourse, or from the sudden effect of cold or wet, in particular constitutions. In the latter it may originate a succession of symptoms of the most harassing kind. The following case is a good illustration.

CASE LII.

Acute Prostatitis.—Suppuration.—Recovery.

A gentleman aged thirty-five, married, and of unexceptionable character, was attacked with the ordinary symptoms of gonorrhœa. These were without much premonitory uneasiness. Having been of a gouty habit, the symptoms were considered and treated as such. After a few days irritability of the bladder occurred, with frequent and urgent inclination to pass water, ending in retention of urine. At this period he was in the country, and the surgeon called on found it necessary to introduce a catheter. The instrument passed with comparative ease, but on examination of the prostate it was found full and enlarged to the size of an ordinary apple. It was remarkably painful on pressure. There was no appreciable fulness in the perinæum. There was much uneasiness and irritability about the neck of the bladder and its region, and there was a variable amount of urethral discharge. The latter now gradually increased, though altering in amount at irregular intervals, and accompanied with equally changeable constitutional irritation. Now sprung up

a fresh additional misery. Some years back, whilst labouring under secondary syphilis, he was attacked with symptoms of that strumo-syphilitico-mercurial character so often perplexing to the surgeon. On the head, on one femur, and on the bones of the forearm, nodes had formed, but had subsided under the usual treatment and had for many years completely disappeared, leaving his health as perfect as ordinary, and admitting of his marrying and getting healthy children. But symptoms of uneasiness in those several bones returned; they became painful, and the periosteum thickened, all accompanied with severe constitutional disturbance. Under treatment, however, the symptoms gradually declined.

This form of inflammation of the prostate gland requires particular care and treatment. No doubt can be entertained that the most prudent step is to stop the inflammation and limit the suppurative process, in the same manner in which all subfascial inflammations should be treated when the ordinary course of treatment is unsuccessful. The patient should be placed in the position for lithotomy, and superficial incisions made as in the two first steps of that operation. When the prostate gland is reached, its fascia or capsule should be divided, as far as you can measure your incision, without entering its substance. The success of such a proceeding is well established, and the protracted suffering of the patient, and his otherwise probably incurable condition, certainly demand it. The rapidity of recovery under the treatment recom-

mended is great, and I am not aware of any relapse or disposition to relapse. Suppose, however, that the patient will not submit to this plan of treatment, how are we to proceed? The presence or absence of retention of urine may perhaps be a good guide for our mode of procedure. Local leeching, the careful exhibition of mercury, hip-baths, cupping the perinæum, and the use of anodynes, with or without saline aperients, and suppositories, will be found useful adjuncts.

CASE LIII.

Acute Prostatitis.—Abscess bursting into the Urethra.—Recovery.

A young gentleman consulted me for acute gonorrhœa, attended with the usual symptoms. He was of most irregular habits; he drank, he smoked, and was addicted to late hours. At the expiration of five or six days he suffered more acutely than usual from most painful chordee, and the penis was in a constant state of congestive excitement, during which hæmorrhage from the urethra took place, but without relief. Treatment was adopted to check his symptoms, and was unavailing. Leeches, hip-baths, anodynes, gave only temporary relief, which was sure to be followed by a recurrence to his usual mode of life. Now irritability about the neck of the urethra set in; his desire to make water was frequent and urgent, and was accompanied with tenesmus, and all the usual symptoms of inflammation of the prostate gland. He was attacked with retention of urine, which, from

his excruciating agony, demanded immediate relief. I was obliged to empty his bladder and did so in the recumbent position. The urine was forced out with so much violence that the catheter would have been ejected, at least partially, had I not held it firmly. The fluid did not present any remarkable change in its appearance, and was almost free from any purulent deposit. The relief was great—the retention did not return, but considerable irritability of the bladder continued, marking the progress of inflammation of the prostate to suppuration. There was no appreciable fulness in the perinæum, neither was there much tenderness. There were the usual uneasy sensations about the anus, and the introduction of the finger was painful. On dilating the orifice of the anus a very remarkable fulness and redness near its verge was exposed, particularly in front; but though there was fulness in the site of the prostate gland, there was not as much tenderness as might be expected on pressure. The bladder was emptied without assistance, but yet with pain and scalding towards the last, and occasionally when in full stream there was a sudden stop. The urine was free from any abnormal colour either at the beginning or at the end of its flow. The treatment was of the ordinary kind. I find that a month later I took in consultation the following note: “Last night has been spent badly, from the effects of oil which had been directed to free the bowels; there had been constant tenesmus, and from the repeated discharge from the bowels no opinion could be formed as to the amount of urinary irritation. There was no appearance of

discharge in the urine, no sediment. On examining the rectum, the circumference of the anus, particularly at its anterior part, was remarkably red and vascular. The fore-finger was introduced without much pain, and on freely moving it and making firm pressure on the prostate, no pain was experienced."

CASE LIV.

Acute Prostatitis.—Abscess bursting into the Urethra.—Recovery.

A man of athletic form, aged thirty-six, was admitted into the Richmond hospital. He was a cattle-drover, and hence exposed to cold, damp, and fatigue, and was moreover of irregular habits. About ten or twelve years back he had gonorrhœa, and was cured within a very short period by medicine and without any injection. Since, he has not experienced any urinary irritation; is married and has children. On the first of the month he had an ordinary feverish paroxysm, referrible to damp and cold, and for the first time suffered uneasiness in passing water; this was accompanied with much pain in defecation, and a constant uneasy feel in the urethra. From day to day the urinary irritation increased, and the water, at first passing *guttatim*, now altogether stopped. He had relief by the introduction of a catheter, which required repetition from day to day; and under these circumstances he came over from Liverpool and applied for admission into hospital. He then had retention of urine; he suffered very great pain in the region of the

bladder and in the rectum ; he had involuntary desire to empty the bladder and rectum, and had the sensation in the latter as if a large ball were present. The penis was in a state of semi-erection, most painful particularly towards the glans, and towards the neck of the bladder. He was in incessant suffering, and from his account was much wasted in a comparatively short space of time, as well from pain as from loss of rest, appetite, &c.

Some days after his admission the rectum was examined with a speculum, but the view was not satisfactory. There was not much pain from the examination. About an hour or so after my visit, he for the first time observed a discharge from the urethra. Next day he expressed himself much easier ; he had great relief from the hip bath, and a profuse discharge from the urethra, the smell of which was heavy and sickening. Next day he was much improved, although the calls to make water were as frequent, but there was less pain in the act. There was not the slightest pain in the perinæum towards the scrotum or towards the anus. The urine was largely loaded with mucus of a dirty whitish colour, rapidly subsiding to the bottom of the vessel. The reaction was alkaline ; triple phosphates were present.

From day to day his condition improved. The urinary irritation still demanded the occasional relief of his bladder. When he left hospital this symptom was much less urgent ; and there was no pain or uneasiness in the rectum. The prostate, however, remained large and full although painless. The patient was able to sit down in any position.

CASE LV.

Prostatitis.—Abscess bursting into the Rectum.—Rectovesical Fistula.

A gentleman, after sexual indulgence, felt a painful hardness in the perinæum immediately in front of the anus. This was accompanied by distressing priapism at night. He had then to undertake a very long sea voyage, and was without medical attendance. After some weeks of torture, during which he was occasionally delirious, a large abscess burst behind the scrotum, which ended in a fistula. On one occasion he was conscious of gas escaping through the opening. On arriving home some months afterwards, the fistula had so far recovered as to allow of his undertaking important work, but he was obliged to give it up. Instruments were introduced into the bladder, with the effect of reducing its irritability. An attack of orchitis supervened followed by suppuration of one testicle. The fistula continued for about two and a half years; but before its closure he observed that urine passed into the rectum at each act of micturition, giving rise to tenesmus and pain. None ever escaped through the external opening of the fistula. Later on, this would not occur for several days at a time, and would then return. The patient declined various operations which were proposed. Ultimately as his health improved, the local symptoms lessened in severity, and I have reason to believe subsided.

The preceding cases of acute suppurative prostatitis are sufficient to illustrate the different ways in which the abscesses may empty themselves, viz., either into the rectum or the urethra, or into both. The misery which they sometimes entail shows how important is their early recognition and prompt treatment.

CASE LVI.

Tubercle in the Testicle, Vas Deferens, Vesiculæ Seminales, and Prostate.

A young man, aged thirty-two years, was admitted to hospital suffering from extensive tubercular disease of both testicles, which had existed for some time. He presented symptoms of phthisis, and suffered much from urinary irritation. An examination per anum revealed considerable enlargement of the prostate gland, and here and there distinct points, evidently the seat of tubercular deposit. His distress was somewhat alleviated, but he gradually sank and died of the constitutional affection. At the *post-mortem* examination, the body of each testicle was studded throughout with tubercular deposits, and there was effusion of serum into each tunica vaginalis. The vas deferens had a hard, irregular, nodulated feel, its outline having a beady appearance. The vesiculæ seminales and the prostate gland were also the seat of deposit, which quite destroyed their natural form. Numerous cavities were found in the lung. The appearances are well shown in Plate VIII.*

EXPLANATION OF PLATE VIII.*

Represents tubercular deposits in (1) the testicle ; (2) vas deferens ; (3) vesiculæ seminales ; and (4) the prostate gland, of the patient referred to in Case LVI.



MR. FLEMING

ON TUBEROULAR DEPOSITS IN THE TESTICLE, VAS DEFERENS, VESICULÆ SEMINALES, AND PROSTATE GLAND.

These cases of tubercular prostatitis are not very common, but they are full of interest to the surgeon. The symptoms are often obscure, the patient's history directing attention rather to the more prominent signs in distant parts. In all the cases I have seen, the testicle has been also engaged, although this latter may be diseased whilst the prostate itself remains apparently healthy. It would seem as if the affection travelled upwards from the testicle, attacking in order *vas deferens*, *vesiculæ seminales*, and prostate. In all cases of tubercular disease of the testicle, a careful digital exploration of the rectum should be made; and in doing so it is well to remember that the finger must be passed well back, in order to make a full examination of the *vesiculæ seminales* and the *vasa deferentia*. In this proceeding I generally place the patient upon his side, in the obstetric position, when, introducing the finger into the rectum, the other hand being pressed above the pubis, I am able to assist the local examination by various movements of the bladder and its parts.

I may here mention another case of this kind which came under my observation recently, and which was in an earlier stage. The patient had contracted gonorrhœa six months before, and had subsequently an attack of orchitis, which became chronic, and ended in the condition known as "benign fungus." The urine was albuminous, and one lung was extensively diseased. The patient died soon after his admission to hospital. The testicle was found to be completely disorganised, and the *vas deferens* nodulated with tubercle at irregu-

lar intervals. The prostate gland had an irregular surface on its right side, which was produced by tubercular deposits, but the capsule was perfect. The vesiculæ seminales were also tuberculous.

These cases are usually referrible to prolonged gonorrhœa occurring in strumous subjects, an affection which is then of very uncertain and slow progress. A tuberculous condition of these organs is always very obstinate in yielding to treatment, and in many instances is incurable, associated as it is with a constitutional taint. The treatment resolves itself into the local and general. As to the former, an occasional leech applied to the cord, the verge of the anus, or the perinæum, will be found useful when there is much heat or throbbing. Suppositories, anodyne enemata, and hip-baths give much relief from pain and irritability. The general treatment will embrace all the ordinary remedies had recourse to in strumous diseases, amongst which cod-liver oil and iron are the most useful. The patient should also seek change of air, and at the proper season, if not contra-indicated, take tepid salt-water baths, or even indulge in open sea bathing. The bowels should be kept in order if necessary by means of some of the mild aperient mineral waters, such as Hunyadi Janos, Frederickshall or Pullna.

CHAPTER VI.

HÆMATURIA.

HÆMATURIA is a symptom in connexion with some injuries and diseases of the urinary organs, which is very often most perplexing to the surgeon as to its source and import. This complication has already been incidentally referred to in connexion with injuries of the pelvis; but the following may be added to elucidate important practical points in reference to its cause and source.

CASE LVII.

Hæmaturia from Injury.—Absence of Vesical Irritation.—Recovery.

A labourer of middle age, and apparently in good health, whilst wrestling with a comrade, was violently thrown under him and rather severely crushed over the abdomen. He continued more or less insensible throughout the following night, and when he awoke felt pain in the umbilical and hypogastric regions. When he first passed water after the occurrence he remarked that the urine was dark-coloured and muddy. He was free from any pain, difficulty, or urgency in

micturition. The urine continuing discoloured he was transferred to hospital, where I saw him the third day after the accident. He then made little complaint, had no lumbar pain or uneasiness worth noting; had no urinary irritation; and but for the appearance of his urine he would have been at his ordinary work. His pulse was perfectly quiet; he had no general symptoms of illness, and no local lesion was traceable on the closest external examination. He had passed water as usual every sixth or eighth hour, and with the most perfect freedom. He urinated in my presence; from beginning to end the fluid was uniformly bloody, and without clot. When viewed in a test-glass its colour was dark chocolate, but on being drained from a white vessel it had a bright arterial hue. Its reaction was acid, its density 1025, and its odour somewhat that of blood. The man stated that this condition of urine had existed from the date of the accident and never before it, and that he had never suffered any urinary irritation. On resting there was a thin blood stratum, which under the microscope presented ordinary blood cells. After a few days of rest combined with restricted diet, dry cupping, and the exhibition of gallic acid and dilute sulphuric acid, all morbid conditions of urine disappeared, and the man left hospital.

Here was a case of hæmaturia from injury producing merely passing congestion of the kidneys, in a healthy individual, and rapidly yielding to mild treatment. Many such are to be met with.

The following case is of more interest, from its unusual cause and from its rapidly fatal termination.

CASE LVIII.

Acute obstructive Phlebitis.—Sudden Occurrence of rapidly fatal Hæmaturia.

An unhealthy-looking youth, aged eighteen years, of most intemperate and irregular habits, applied occasionally at the Netterville Institution with anomalous dyspeptic and syphilitic symptoms. His aspect was pallid and strumous; he had from childhood enlarged cervical and inguinal glands, which had suppurated at different intervals: and he now sought admission to the Richmond Hospital with swelling of his left leg and foot, which he stated had arisen within a few days, spontaneously, and which wholly incapacitated him for work. He had not met with any accident, neither had he any local affection to account for the attack. It commenced with fever of a typhoid character, and the local symptoms were almost coeval with it. The dorsum of the foot was cedematous, and the calf of the leg tensely so, particularly along the outline of the tendo Achillis; the integuments not presenting any appreciable discoloration, but being most acutely painful to the touch. The saphenous veins with their tributary branches were tense, hard and prominent, especially at their respective terminations, and a faintish blush

was visible along the course of the absorbents of the thigh to the groin. The diagnosis of acute obstructive phlebitis of the deep and superficial veins of the leg and thigh, accompanied by inflammation of the absorbents, was conclusive, and the requisite treatment adopted. From day to day the local symptoms advanced, until the whole extremity presented the appearance usual in an aggravated case of "phlegmasia dolens." After a week a decided improvement had taken place in the aspect of the limb and in the general symptoms, when, with a fresh accession of fever, the right extremity became engaged as the left, and quickly assumed the same characteristic features. To hardness, tension, and tenderness of the femoral and saphenous veins, traceable even to the iliac vein, was added a marked congestion of the superficial abdominal veins, particularly on the right side; and now, quite suddenly, severe and uncontrollable hæmaturia took place, accompanied by painfully recurring attacks of retention of urine, produced by blood-clots obstructing the tract of the urethra, and requiring repeated introductions of the catheter for relief. The colour of the urine was uniformly of a dark claret, and its reaction was alkaline; it had a blood odour, and was perfectly opaque. Its density could not be satisfactorily ascertained, on account of its thick coagulated condition. No treatment was of avail; the poor fellow died within twenty-four hours from the commencement of the hæmaturia, with the usual symptoms of uncontrollable hæmorrhage from any other cause, the whole cutaneous surfaces being perfectly blanched from

its effect. His intellect remained perfect till within a short period of his death.

A hurried *post-mortem* examination was surreptitiously made, about twelve hours after death, but was necessarily wholly restricted to the source and cause of the hæmaturia. Plate III. represents the pathological conditions identified with it. The enormously congested state of the right kidney contrasted with that of the left, which was evidently affected with Bright's disease; the portion of the right femoral vein, the seat of the original phlebitis, and the character of the urine found in the bladder, both as to colour and alkalinity, are excellently illustrated. The right ureter was gorged with semi-coagulated blood, with which the bladder was also filled, and the lining membrane of each was stained deeply with it. No symptom of albuminuria was exhibited or complained of during life, and hence the subject was not investigated, but the man's aspect indicated its presence. The hæmaturia was distinctly traceable to the condition of the right kidney. Its emulgent vein was distended with blood, which tensely filled the vena cava as far as its union with the common iliacs; and on laying open their canals the contained fluid was found of a grumous consistence, blocks of coagula being interspersed at irregular distances, having a more plastic character in the external iliacs, particularly the right, the canal of which was almost wholly obstructed. The lining membrane of the renal veins and the vena cava was smooth, though deeply stained with blood; that of the iliac veins was rough-

ened, and appeared to have an intimate connexion with its contents. The dark colour of the right kidney, as seen through its capsule, was very remarkable, and the tension of the latter was equally so on making a vertical section of the organ, its structure being protruded considerably beyond it, and a quantity of dark blood oozing from its cut surface.

CASE LIX.

Recurrent Hæmaturia.—Slow Progress.—Fatal Termination.—Post-mortem Appearance.

A military gentleman, of middle age, suffered for a lengthened period from repeated attacks of hæmaturia at irregular intervals, often occurring suddenly without any appreciable cause, and attributable in his opinion to a hurt in the perinæum when he was nine years old, from riding on a bare-backed horse. This occurred in 1839. In 1846 he observed for the first time that his urine had a bloody tinge, that this continued for more than a month without his suffering pain of any moment, and that he could not assign any cause for the attack. He now passed some years with his regiment in the East, and in 1851 returned on sick leave, with enlargement of the spleen and liver, and congestion of the right lung. Having recovered his strength he was enabled to rejoin his regiment, but in 1854 and 1856 he had a repetition of the hæmaturia, which lasted only a short time, the urine continuing muddy in the intervals. Beyond occasional and mild attacks of irritability of the bladder there was no incon-

FIG. 3.

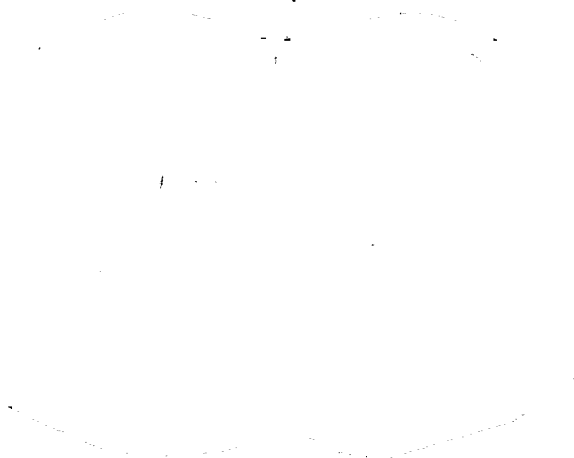


FIG. 2.



FIG. 1.

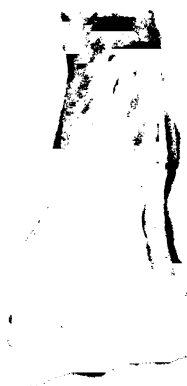


FIG. 4.

EXPLANATION OF PLATE III.

- Fig. 1.** Portion of left femoral vein, including the termination of the saphenous, opened, exhibiting the phlebitic condition of the coats of the former, and the tubular arrangement of its contained coagulum. Case LVIII.
- Fig. 2.** Colour of the urine, and its alkaline reaction, during the attack of hæmaturia.
- Fig. 3.** Longitudinal section of right kidney. Increase of size compared with left kidney (Fig. 4).
- Fig. 4.** Section of left kidney, surface of section showing an extensive mottling in different portions from escape of venous blood. Malpighian vessels, renal tubules, &c., filled with grumous blood.

venience noteworthy, he being able to ride on horseback and do as he pleased in the way of exercise. From 1858 the hæmaturia became more frequent; and continuing to increase, and with more or less suffering, at shorter intervals, he was recommended to have his bladder examined as to the presence of stone; and under these circumstances I was desired to visit him, at some distance from town. I met in consultation his medical attendants, and on examination of the bladder could not discover any sensible signs of ~~calculus~~ *calculus*. The instruments used passed freely into the bladder, and the urine drawn off was healthy-looking. I left next morning for town, and subsequently learned that no annoyance of any kind followed the examination. The bladder remained quiet under rest and ordinary palliative treatment, and no hæmaturia manifested itself. In 1864 and in 1866 there were recurrences. That in 1866 I saw; it was most aggravated and occurred quite suddenly. The quantity of blood in the urine was very considerable; there was no vesical irritation, but there was great irritation from the partial obstruction in the urethra, caused by large lengthened clots escaping along its tract. No absolute obstruction occurred if the urine was allowed to pass while the patient lay on the left side, as it was remarked by him that in the erect position the flow of the urine was wholly interrupted. The colour of the urine whilst escaping was alternately florid and bright red, or again dark and coffee-coloured, streaking in remarkable flakes of semi-coagulated blood, very visible at the bottom of a white chamber, and almost conclusive as to the

absence of any admixture with pus or mucus. In such a condition of urine density or reaction is not satisfactory. I have detailed cases in these records in which the urine was I might say clotted throughout, and in which the reaction was decidedly alkaline.

I was unable to visit this poor gentleman during his last illness, but owing to the kindness of his medical attendant I am enabled to give a rough outline of the *post-mortem* appearances presented. What reflections do not those appearances suggest, and especially in connexion with the extraordinary duration of the illness, and tolerance of so much of morbid change!

“The patient died in 1866. The body was examined forty hours after death. There was great emaciation, and the skin was jaundiced. The contents of the thorax were not examined. There was a quantity of dark-brown serum in the cavity of the abdomen. The viscera were matted together by old adhesions. It was very difficult to detach the liver from the diaphragm and the stomach. The peritoneal investment of the gland resembled a coating of yellow leather, an eighth of an inch thick. The gall bladder had almost disappeared, there being no cavity and no bile. In short it was only a yellow fibrous mass. The liver was shrunken under the ribs, and presented the characters of chronic yellow atrophy to an extreme degree. It weighed about two pounds, and was of a light yellow colour. All trace of hepatic cells and vessels had disappeared, and these were replaced by a tough structure consisting of yellowish fibrous lines and fatty material. All trace of portal ves-

sels and of the hepatic arteries and ducts had disappeared. The spleen was enormously enlarged, and the peritoneal covering resembled that of the liver. It weighed about two pounds. The left kidney was healthy except at its upper part, which was dense, tough, and mottled with yellow. The capsule was adherent. The right kidney was so closely attached to the neighbouring parts that it could not be detached. It was quite disorganized, and in a state of fatty degeneration. The bladder was adherent to the small intestines. Its lining membrane was vascular and congested in patches, but not otherwise diseased. The whole body was anæmic, and scarcely any blood escaped when even the largest vessels were divided. There was no anasarca.”*

CASE LX.

Hæmaturia in the Child.—Recovery.

A delicate boy, aged five years and a-half, son of the gentleman whose case has just been given, com-

* This case had some characteristics of paroxysmal hæmaturia. The affection is a rare one, and has been variously called intermittent hæmaturia, hæmoglobinuria, and hæmatinuria. The term used here is that proposed by Dr. Pavy. The cases reported show that the attack is ushered in and attended by symptoms not unlike those of ague. In some cases enlargement of the liver and the spleen are noted. It is said that there is no hot stage appreciable to the hand, but the thermometer shows increase of temperature in certain instances. The frequency of the attack varies, sometimes occurring daily, sometimes at intervals of years. Between the attacks the urine is usually clear, with a specific gravity varying from 1005 to 1030, and an acid reaction. Oxalate of lime crystals are present. No instance has been recorded in which members of the same family have been affected. [See a paper by Wickham Legg, M.D., in *Bartholomew's Hosp. Reports*, vol. x., 1874].

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

MR. FLEMING

ON MALIGNANT DISEASE OF THE BLADDER AND OF THE PROSTATE GLAND.

EXPLANATION OF PLATE XI.

- Fig. 1.** Interior of bladder affected with cancer, showing nodulated condition of the mucous membrane, and the development of Guthrie's bar. (Case LXI.)
- Fig. 2.** Section of the healthy prostate gland, with diseased vesiculæ seminales. (Case LXI.)
- Fig. 3.** Rib surrounded by malignant disease. (Case LXII.)
- Fig. 4.** Portion of liver with scattered masses of cancerous deposit. (Case LXII.)

plained of a chill, pain in his side, and became very pale. Soon afterwards he passed a quantity of bloody urine, described as being similar to that noted in the preceding instance. No doubt could be entertained as to the presence of blood. He was brought to town, and I sounded his bladder, but there was no evidence of stone. Small doses of Battley's Sedative and iced drinks allayed his urgent symptoms. After a few days the urine recovered its natural appearance, under treatment by rest and turpentine. As I learn, the boy has not had any return of the attack, and is now much improved in general health.

I am strongly disposed to the opinion that the hæmaturia was renal in its origin in this instance, and traceable to the passage of a small calculus which escaped without detection.

CASE LXI.

Cancer of the Bladder, Vesiculæ Seminales, and Liver.

A farmer, aged fifty-three years, was admitted to hospital in a moribund state, and died in about a fortnight. The origin of his disease was traceable to a period distant about four months, the symptoms indicating its presence being irritable bladder, hæmaturia, and most painful dysuria. Eight or ten years previously this man had been the subject of stricture, and had been treated by caustics, with, as he stated, permanent relief. His present illness was sudden in its onset, and in its progress was most agonizing and

rapid. The bladder was intolerant of the presence of urine, the quantity passed at each time being small and its odour most offensive. He complained of pains shooting in different directions, sometimes confined to the hypogastric region, at others extending along the perinæum to the glans penis, and again shooting towards the sacrum. There were occasional attacks of painful tenesmus. The countenance was sallow, the whole frame emaciated, the extremities cedematous, and the prostration extreme.

On examining the hypogastrium a solid resistant projecting mass was detected in the region of the bladder. In the rectum the prostate was found fuller than natural; and on passing the finger beyond it, an irregular hardened tumour was felt, which, when poised up and pressed against the fingers of the opposite hand, placed above the pubis, communicated the sensation as if one continuous growth was impacted between the rectum and the bladder. A catheter introduced into the bladder gave excruciating pain, yet his cries for its continued use were almost incessant. The facility of introduction was very uncertain. At one time it entered without any interruption, again it required much dexterity to guide it, and again it did not appear to reach the bladder satisfactorily. On no occasion could more than about an ounce of urine, horribly foetid and loaded with blood, mucus, and phosphates, be withdrawn. No treatment gave relief. The stomach and rectum became uncontrollably irritable, and the unfortunate man sank from exhaustion.

The penis and bladder were removed in their natural connexions, and on opening the latter it could hardly be said that any cavity existed within. It contained about an ounce of fluid. The bladder was incapable of distention, its posterior wall from the prostate to the upper fundus being transformed into a thick encephaloid mass, intermixed with a sort of scirrroid material of considerable thickness, principally deposited in the submucous tissue, and throwing forward into irregularly nodulated eminences the inner surface of the viscus, covered with dark congested mucous membrane. The prostate was not involved, but immediately behind its base a cross-bar of the same diseased structure stood forward (as shown in Plate XI.), which would help to explain the difficulties experienced in the introduction of catheters. The irregular tumour felt behind the prostate consisted of the vesiculæ seminales, infiltrated with the same malignant deposit, and so consolidated the one with the other as to be identified in the general mass of disease. The prelumbar and mesenteric glands were also diseased and matted together, and the liver was studded throughout with cancerous deposits.

CASE LXII.

Encephaloid Cancer of Bladder, Vesiculæ Seminales, Kidneys, Liver, and Rib.—Calculus.

A gardener, aged between forty-five and fifty years, was admitted for urinary distress. His illness commenced about two years before, and was attributed

by him to retaining his urine for too long a period after he had a desire to pass it. His first symptoms were irritable bladder followed by hæmaturia, ultimately attended by excessive pain during and after micturition. The hæmaturia became more frequent, micturition more painful, and he was forced to seek admission to hospital. Previously and subsequently to his admission he was sounded for stone, and although occasionally I got the sensation as if one was in the bladder, still it was only passing and equivocal. The introduction of instruments was always painful, and was followed by severe hæmaturia, but the patient believed that his symptoms were relieved by them. The case progressed rapidly and emaciation set in. The abdomen became so lank that the bladder, or a tumour corresponding to it, could be felt above the pubis as a hard resisting solid ball, and through the rectum a large tumour was also discernible beyond the prostate, giving considerable resistance when pressed against. Agonizing and lancinating pains were experienced in the vicinity of both, and throughout the whole pelvis. About this period also great pain was complained of in the course of one of the false ribs on the left side, where considerable fulness and tenderness existed, with some physical signs of pleuritis. The demands for the catheter were incessant, but at last none could be introduced, and the patient sank from his distressing sufferings. The urine was throughout subject to changes. It always contained blood to some extent, the appearance being influenced by the intensity of the acid or alkaline reaction present. For a time it was

acid; then it was of average density and amount; and repeatedly oxalate of lime and lithic acid crystals were visible under the microscope. Ultimately that fluid was persistently alkaline, very foetid, diminished in quantity, and full of mucus, blood, and phosphates.

On slitting the bladder in front from the neck to the fundus, the coats yielded so very slightly that it was necessary to remove an elliptical portion in order to expose the very limited cavity within. The small quantity of urine it contained had all the characters noted above, and a small calculus the size of a pea was present. It was friable and phosphatic. The mucous membrane was dark and in part abraded, but yet free from any absolute ulceration. It exhibited the nodulated appearance so often associated with tuberciform encephaloid growth developed in submucous tissue. This growth was particularly well marked in the posterior wall of the bladder and towards its base, where it had reached a thickness of nearly two inches. Here the tumour felt through the rectum was fully identified with it, and appeared to be the transformed vesiculæ seminales. The prostate gland was healthy. The whole structure of the bladder was so dense and unyielding that even by firm compression the urine which remained in the bladder could not be emptied out. Both kidneys were diseased, as seen in Plate X, and were infiltrated with malignant deposit. The liver was similarly affected, and the rib exhibited an excellent specimen of the same disease, the bone lying broken in the morbid mass.



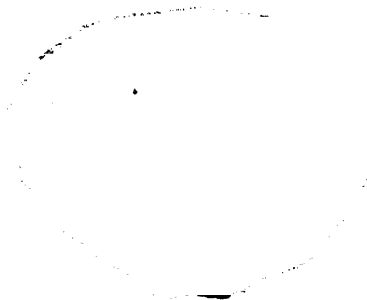
FIG.1.



FIG.2.



FIG.3.



MR. FLEMING

ON MALIGNANT DISEASE OF THE KIDNEY AND BLADDER.

EXPLANATION OF PLATE X.

- Fig. 1. External surface of kidney thickly covered with miliary cancerous deposits. (Case LXII.)
- Fig. 2. Section of kidney showing infiltration with same material. (Case LXII.)
- Fig. 3. Bladder the seat of cancerous disease, showing a small calculus. (Case LXII.)

Cancerous disease of the bladder is one of the most distressing forms of urinary affection. As to cure, it is beyond surgical skill, and the utmost limit to which our art can reach is the amelioration of the patient's sufferings. There is usually copious and frequently recurring hæmaturia, added to which there are irritability of the bladder, lancinating pains in the groins, inside of the thighs and back, enlarged glands in the inguinal regions, with general wasting. Examining over the site of the bladder, that viscus will usually be found to assume a conical shape, varying little in size owing to the thickened condition of its walls, and having an irregular, nodulated surface. But on the other hand we meet with cases in which the disease progresses so insidiously as not to attract attention until an advanced stage.

The affection may be either primary or secondary. When it is the former, it often results from some prolonged local irritation. In one case in which I removed a large stone from the bladder, the patient was attacked several years afterwards by cancer of that viscus, and died.

Our treatment can only be palliative, restraining hæmorrhage, and relieving pain by sedatives administered by the mouth or as suppositories. In some cases I have found the injection of the vapour of a few drops of chloroform, by means of Harding's apparatus for the uterus, a very successful method of combating the wearing agony.

CASE LXIII.

Polypus of the Bladder.—Hæmaturia.—Death.

A man of advanced age was the subject of fre-



Fig. 16. Polypus of the Bladder.

quently recurring attacks of violent hæmaturia. At times he appeared almost bloodless, but the symptom

was usually controlled by the use of styptics. This continued for many years, and although he was examined frequently, no stone or morbid condition of the walls of the bladder could be detected. He ultimately became dropsical, and died in one of the workhouses. On opening the bladder, a polypus such as figured on page 219 was found springing from the fundus. It was fibro-cellular in structure, and non-malignant, and lay collapsed in the cavity.

Polypoid growths of the bladder are rare, and do not usually give rise to the severe hæmorrhages which characterised this case. The diagnosis of their presence is very difficult; and even when that is satisfactorily made out, our treatment can only be palliative.

Hæmaturia is always a condition which ought to engage the prompt attention of the surgeon. It is not in itself a disease, but is rather an indication of morbid changes proceeding in some portion of the system, not necessarily involving the urinary tract. We not unfrequently meet with cases in which it is not possible to interpret its meaning. Thus it may occur suddenly in an apparently healthy man, and may pass off as quickly without any bad effects. It is to be borne in mind, however, that we may be deceived by the appearances of urine presented to us. Patients who may be undergoing some surgical treatment with carbolic acid applications often pass urine which is apt to mislead by its colour. In the same way, the eating of red beet may produce a

similar effect. In one case a number of young men who had been dining at the same table came to me in great alarm at the presence of blood in their urine. I happened to know that they had partaken of the fig of the cactus, and I was able to prove by experiment that this fruit was capable of producing remarkable changes of colour in the urine. Cases also occur in which females, either suffering from hysteria, or for interested motives, may deceive the surgeon by mixing blood with the water; but in those instances where a suspicion exists, I always take care to prevent such interference by having the patient watched. As a rule in all urinary cases it is better to have the urine passed in our presence, where that is possible.

The presence of blood may usually be determined by the appearance of a stratum of coagulum at the bottom of the vessel; and in cases of malignant disease, as in the instances just reported, the prune-juice colour is reliable evidence of the nature of the affection.

Hæmaturia is also a symptom of ruptured bladder: and I may here note a case which came under my observation in which there were some points of interest. A fine young fellow was thrown down while wrestling, and was severely crushed over the region of the bladder by the knee of his opponent, who fell upon him. The symptoms of ruptured bladder supervened. A catheter was introduced, but only an ounce or two of bloody urine could be taken off at a time. A tumour was detected in the supra-pubic region, and as it was supposed to be a collection of urine in the bladder, a

trochar and canula were introduced there, but without good result. The man died in a few days, and it was then found that the bladder had been ruptured at the fundus, and only contained a small quantity of bloody urine. The tumour in the hypogastrium was formed by blood, partly coagulated, which had gradually forced its way between the peritoneum and the bladder, and travelled to the place in which it had been mistaken for retained urine.

The treatment in these cases must depend upon the cause of the symptom, if that has been determined. In general terms, styptics and rest are our best hope. Gallic acid in large doses, alum, turpentine, sulphuric acid, iron, matico, Ruspini's styptic, or an infusion of dried peach-leaves, will usually be found efficacious.

CHAPTER VII.

STRICTURE OF THE URETHRA.

STRICTURE of the urethra is one of the more common forms of disease of that canal, and is always a formidable affection, whether viewed as to the present inconveniences it produces or as to its ultimate disastrous effects. A large number of cases have come under my observation; but the literature of the subject is so copious that I will content myself by some general practical observations, the result of my own experience.

The examination of a large number of specimens shows that the disease exists, in the greatest number of cases, in the region of the bulb; and that it may indeed exist in any tract of the urethra, with the exception, so far as we at present know, of the prostatic portion. The character of the contraction will always necessarily influence the value of the treatment; but it is a remarkable fact that the nearer it is to the orifice, the more doubtful will be the success of surgical interference. Strictures at the meatus, whether the result of specific ulcerations or otherwise, are in the practice of all surgeons the most obstinate in yielding to the usual methods of treatment, the process of contraction very speedily setting in again. In these cases of narrowed

orifice, acquired or congenital, I have seldom seen an instance in which there was not an accompanying stricture in the region of the bulb. It does not seem at all necessary that there should be the inflammation of the mucous membrane, no matter whence arising. If I were to hazard an explanation, it would seem to me to be found in the want of consensive action between the orifice and the expelling forces. The urine coming from behind from a healthy bladder through a urethra which presents no impediment, is suddenly stopped to a great degree at the meatus. The result of this is a throwing back of the stream upon the parts behind, and an effort of the expelling muscles to overcome the obstruction. From this irritation, frequently repeated, I think the canal in the region of the bulb takes on a very mild chronic form of inflammation, and gradually becomes narrowed in its diameter.

I have found the same condition in the urethra of children, produced in a similar way. It is always associated with an elongated prepuce having a very tight orifice, through which the urine escapes with difficulty. Nor is it altogether confined to males, since I have met with a few instances in the female, attended by great irritability of the bladder, urgency and frequency of micturition, pain at the close of the act, but without any trace of blood at any period. In the case of a lady presenting these symptoms, I found the smallest orifice of the urethra that I had ever seen. I was able to pass an instrument with some difficulty, but just as it entered the bladder it met with a distinct obstruction. I removed the urine, which was of the

character of *urina potus*. I at once introduced a dilator and increased the diameter of the urethra to its normal size; and on subsequent careful examination no trace of stone could be found. The patient recovered.

A form of impediment which I am not aware of having been before described, has sometimes come under my notice. For very many years I have been in the habit of directing the attention of my class to the existence of what may be termed a valvular stricture of the urethra. It seems to owe its origin to a loose condition of the mucous membrane. One or more valvular flaps project across the course of the canal, laterally or antero-posteriorly, the free margins presenting in the direction of the orifice. In some of these cases the patient suddenly becomes the subject of complete retention of urine, and all the efforts of the surgeon to relieve him by a catheter may fail, the point of the instrument getting into the pouches formed by the bases of the flaps at their attachment to the urethral wall. I have frequently seen, however, that success in passing an instrument followed the turgidity of the penis which occurs in so many of these cases. I have already warned the young surgeon against the dangers which beset him in using a catheter under such conditions; and it may at first sight seem difficult to reconcile my previous statement with my experience in the class of cases under consideration. But the ease with which the bladder may be relieved in some of these instances appears to me to be owing to the anatomical arrangement of the parts involved. As the corpora cavernosa and corpus spon-

giosum increase in size, the lax mucous membrane of the urethra becomes more closely adapted to the structures immediately underneath, and the tension in a great degree temporarily removes or unfolds the valves which form the obstruction, so that the catheter may reach the bladder.

With respect to the question of the treatment of the ordinary organic strictures of the urethra, I am satisfied that notwithstanding the many objections which have been made to the process of gradual dilatation, that plan is more generally applicable than any others recently suggested. In some remarks which I made on the subject at a meeting of the Surgical Society some time back, I exhibited a catheter of a shape which I had found to be particularly easy of introduction into the bladder in many obstinate cases of stricture; and latterly especially I adopted it in the operation for the "Immediate Treatment by the employment of the Stricture Dilator," by Mr. Holt. The last step of that operation is, modified for its special object, to substitute for the fully armed "stricture-dilator," *directly on its removal from the bladder*, a metallic catheter of proportioned calibre. Having seen much interruption to the free passage of an ordinarily shaped catheter under such circumstances, it occurred to me that one having a curve (see fig. 17) somewhat similar to that of Mr. Holt's dilator might reach the bladder with comparative ease, and might be less likely to disarrange the newly channelled urethra. The size of the instrument was made to correspond with that of No. 12 on the ordinary catheter gauge,

and its length from the handle was arranged to be less than 9 inches. With the former provision it will meet the object of Mr. Holt, and with the latter it will give much power to the surgeon in its guidance. Indeed in all metallic bougies or catheters for dilatation of strictured urethræ, whether that dilatation is to be gradual or abrupt, a *short instrument* appears to me to be specially applicable, its limited length fully reaching the seat of the disease, and its movements being more easily controlled. Even as regards Mr. Holt's dilator, I should prefer for my own use, and have had it so made, one about an inch shorter. In the hands of so experienced a surgeon as he is no accident could happen, but in the rapid "thrusting of the tube upon the wire between the blades," as he directs, I should apprehend mischief, if there were not a full consent of action in the movement of the hands of a less expert operator. A shorter instrument would answer as a protection against such a contingency, and would lessen the risk of any contact of its distal end with the bladder. In the treatment of all strictures of the urethra, a metallic instrument of the ordinary length is not required, the usual site of the extreme distance of the disease from the orifice of the urethra



Fig. 17. Catheter of the shape of Holt's dilator.

being tolerably accurately known, and the impropriety of using any instrument in a congested state of the penis, when that distance may be increased, except under special circumstances, universally admitted. Nay more, I am fully convinced that in not a few such cases, strictures are assumed to exist where the tract of the urethra is perfectly normal. That the operation advocated by Mr. Holt is feasible cannot be questioned, but difficulties have to be encountered. The introduction of his dilator is often perplexing, and a dexterous surgeon will occasionally fail to introduce it into the bladder where *there is not a trace of stricture*. Here for example:—A military man of high rank called upon me to consult me as to the propriety of the adoption of this mode of treatment of his stricture, which he stated he had laboured under for a lengthened period, and which he had latterly been in the habit of treating himself, being unequal to the expense of constant surgical aid—adding that rarely, if ever, could he succeed with No. 2 or 3 metallic bougie or catheter, and that then his agony was so excruciating that he dreaded the attempt. Handing him a case of metallic instruments I desired him to select one which he considered would be suitable. He allowed me to place him in the sitting position; and, promising to be as gentle as possible in passing the instrument, I quickly substituted one up to No. 8 on the gauge, and introduced it into the bladder without the slightest interruption.

I cannot but think that the modified dilator of Mr. Holt has a disadvantage in being larger than that

he first used, and that hence it is less likely to be effective; it being a necessary preliminary step to prepare the urethra for No. 5 or 6 catheter, whereas No. 3 or 4 answered for the latter: and under such conditions the extreme inelasticity of the more inveterate and old stricture would be less likely to yield. I have always used the first dilator, and I never met with any case in which its presence in the bladder was not immediately indicated by the escape of urine along the sides of the instrument, even before its blades were separated. In a recent case I emptied the bladder before the operation was commenced, and I did not introduce a catheter as suggested by Mr. Holt, until the second day, when I followed up the ordinary treatment as recommended. In internal urethrotomy no catheter was introduced by M. Civiale; and in a case in which I did that operation as suggested by M. Maissonneuve, no catheter reached the bladder, yet two months afterwards I saw the patient pass his urine in an excellent stream. In this operation no doubt could be entertained as to the complete section of the stricture with a clean-cutting knife. The bleeding I have seen in the cases which came under my observation was so trifling that it deserved not the name of hæmorrhage. In two most inveterate cases of double stricture, one at the orifice of the urethra, all the details of Mr. Holt's operation were most rigidly carried out to the fullest dilatation, and yet not a trace of even a rent could be noted at the urethral orifice. When the dilator and catheter were removed, it really presented an appearance much resembling that which would be produced by the punch-

ing of a large hole through a thick piece of Spark's leather. The ultimate result of these cases was not one jot better, however, than I had had by the ordinary gradual dilating process.

In those cases in which Professor Syme's operation for external division of stricture appears to be advisable, I have devised a staff director which I have been in the habit of using. I have, perhaps, performed the operation more frequently than any other hospital surgeon in this city; but I cannot bring to my recollection even one case in which I have seen, in private or in hospital practice, "Syme's urethral section" properly so called, although I have been present where it was nominally performed. This statement I make advisedly, as it is all-important in estimating the value of this able surgeon's suggestions that his special directions should be accurately followed. The instrument which I beg to recommend is merely a modification of others already in use. With it, in fact, a combination of the objects contemplated by Professor Syme with his grooved staff-director, and those by Mr. Wakley with his guide and flexible tube, is accomplished. It consists of a solid steel rod, 22 inches or so in length, similar to that of Mr. Wakley's guide—like it, curved at one extremity, and ranging at No. 2 on the ordinary catheter scale, so that the movable handle is easily adjusted to it. It is, moreover, also divisible for convenience of carriage, into two portions joined by a screw. About two inches from its curved or vesical end, a groove commences on its convex aspect, which

extends towards the external or proximal. When ready for use, its movable handle being firmly fixed, the staff is passed into the bladder, and the section of the urethra made according to the directions laid down by Professor Syme. Before it is removed a flexible tube is passed over it, and by a double movement the latter is substituted for the staff and secured in the bladder. The tubes I have used range between Nos. 6 and 8, and their easy transit satisfies the surgeon as to the required section of the stricture.

The advantages of such a provision for the safe conducting of a catheter in urethral section, no matter with what object demanded, must be obvious; and all must admit the great annoyance experienced when under such circumstances catheters are being introduced into the bladder. Even in urethral section in front of the scrotum, from accident or otherwise, this contingency will occur. A tubular silver catheter might be constructed to answer the above purpose; but I must acknowledge that my experience, such as it may be, is favourable to the gum-elastic for the object contemplated.

In my opinion the ordinary method of gradual dilatation by means of bougies or catheters is preferable, in the great majority of cases, to any of the more formidable operations proposed for the cure of stricture. Very many persons become strangely reconciled to this mode of relief, tedious as it often is. It is true that in some instances the use of a simple bougie in the treatment of this affection is followed by symptoms of the gravest kind, but as a rule it is

free from the risks which beset any of the bursting or cutting operations. The conical catheter which is figured here I have found to be of great advantage in such cases. It is shorter than usual, and the surgeon has more power in manipulating its passage to and through the obstruction. It will be found best in most instances to pass the instrument only every second or third day, keeping the patient if possible confined to bed. Now and then, however, we meet with patients in whom great difficulty is experienced in introducing an instrument even of the smallest size. In such cases, it is a good rule to leave the instrument in the urethra for twenty-four hours or more. The result is often very striking. For, on removing suppose a No. 1 at the end of the first day, we are able at once to introduce an instrument some sizes larger. This may be allowed to remain in for a further period if there is not much irritability, and by this means a stricture which at first appeared almost impassible will be rapidly dilated to a fair diameter.

On the other hand, I have frequently attained the same result in much shorter time. Introducing a catheter



Fig. 18. Conical Catheter.

when I entered the hospital, I have returned to the patient after my visit to other wards, and have at once passed an instrument of a diameter some sizes greater. In using this conical catheter it will occasionally happen that it will be viced in the strictured portion of the urethra as the instrument increases in diameter, and it will be found a useful expedient to wait for a few minutes, and then gradually to press it onwards, when frequently it will be found to pass through the obstruction. If however, we endeavour to advance the catheter without this precaution, we shall simply carry the morbid structures before us, and be deceived as to the progress of the instrument.

To secure the catheter in the bladder, I have found the following proceeding the one most easily adopted. A piece of double Berlin wool is securely tied midway in its length upon the catheter, at a variable distance from the ivory top. The two ends are then brought together in a knot at a point corresponding to the cervix, a loop thus extending from the catheter to the part immediately behind the glans. Both ends are next passed round the cervix two or three times, and another knot is secured beneath near the frænum. The ends are then carried forward and are secured in front of the first knot made upon the catheter. By this simple means the instrument is secured in the bladder with the least inconvenience.

Many surgeons advocate the upright or the horizontal position in catheterization. The consideration is an important one, and cases occur in which we are compelled to vary our practice. In the first there is al-

ways the risk of the patient becoming faint and falling. The second I regard as safer, because the patient is unable to withdraw himself from the operator, and the surgeon is obliged to observe more strictly the cautions which guard the passing of an instrument into the urethra. But in cases otherwise favourable, I have found that a very satisfactory plan is to introduce the instrument while the patient is sitting, either on the edge of the bed or in an arm chair. This combines the advantages of the horizontal and the upright positions. The patient's feet should be on the ground, and the body should be thrown well back, the perinæum being freely exposed. In this position he is unable to evade the passage of the instrument, while the surgeon sitting opposite to him and able accurately to note the correspondence between the course of the urethra and the middle line from the umbilicus to the pubis, has full power to depress his hand at the proper moment, and to pursue whatever manipulations may be necessary to reach the bladder.

Occasionally complicating cases of stricture, or of injury of the urethra, is the occurrence of abscess. In some instances the urine has escaped through a rent in the canal behind the obstruction, setting up inflammation in the tissues immediately surrounding, while in others the irritation is in the cellular tissue external to the parts forming the body of the penis. These may occur in the pendulous or the scrotal portion of the organ, or in the perinæum. We meet with the latter more frequently, sometimes as a well-marked ridge-like projection in the perinæum, within the perpen-

dicular septa of the fascia, brawny, and without fluctuation; sometimes, when the abscess is more superficial, as a prominence which can be seized in the fingers, moved laterally, and drawn out from the parts immediately underneath. The position of the testes in relation to abscesses occurring in these regions is deserving of notice as forming a guide to the surgeon. Where the abscess is in the perinæum, and in front of the triangular ligament, the testicles will be found pushed forward, as shown in fig. 1, Plate VII. On the other hand, when the abscess occurs in the true scrotal part of the penis, the testicles are driven backwards, as shown in fig. 2, Plate VII. This relation of the testicles is not confined to abscesses only, but also occurs in cases of contusions in these parts, attended by extravasation of blood or urine, as is well exemplified in figs. 2 and 4, Plate V.

In estimating the situation and origin of a perinæal abscess, it is indispensable to keep in mind the anatomy of the region, especially as regards the connexions of the superficial fascia, which must influence the progress of such abscess. In many instances these abscesses are chronic in their progress, and hence comparatively painless; and when they arise on either side of the mesial line, they often escape detection unless by special examination. Such abscesses, in my opinion, take a course obliquely backward towards the anal division of the perinæal region on either side of the mesial line, usually the left, and are at this region rather accidentally discovered. They take their root, if I may be allowed so to express myself, in the

EXPLANATION OF PLATE VII.

- Fig. 1.** Perineal abscess, showing the testicles pushed forwards towards the root of the penis.
- Fig. 2.** Abscess in the scrotal portion of the penis, showing the testicles pushed backwards.
- Fig. 3.** Urinary fistulae.
- Fig. 4.** Lupoid ulcer of the penis, occurring in wine-bottlers.

FIG. 1.



FIG. 2.

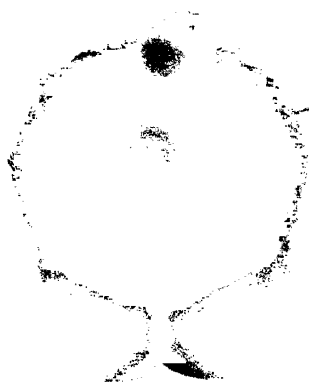


FIG. 3.



FIG. 4.



MR. FLEMING

ON URETHRAL ABSCESSSES, AND URETHRAL FISTULÆ.

bulbous portion of the urethra, which in such cases is always the site of the stricture, implicating more or less the membranous region, and so far continuous in its nature. The origin of the abscess may be external to the urethral tract, or may originate in it, but in every instance I have met with it simulated the blind internal fistula of the anus, and was continuous with the canal. I have satisfied myself that in such cases the course the fistula follows is anterior to the anterior layer of the triangular ligament, and posterior to the anterior division of the superficial fascia which identifies itself with the base of this ligament. These anatomical considerations will account for the fact that the progress of such abscesses is towards the anal region, not towards the true perinæal, and in this course they soon involve the adipose structures in the ischio-rectal space or fossa, and simulate abscess in this locality. Abscesses are not confined to these parts, however. They may occur posterior to the triangular ligament, and gradually travel backwards between the reflexions of fascia and the bladder, until they present at the supra-pubic region. This condition is extremely rare; but I have seen some cases in which no other explanation could be given.

When matter is diagnosed, it should always be evacuated as speedily as possible. The result will depend upon whether the abscess communicates with the urethra or not. When this happens, we generally have fistulæ following, as depicted in fig. 3, Plate VII., and taxing the patience and skill of the surgeon to the utmost. Very frequently, however, these cases make

a speedy recovery without much suppuration, after the stricture has been dilated. It is a good plan then to accustom the patient to use the catheter himself. He should introduce it whenever he needs to make water. By this means the irritating fluid is prevented from passing along the track of the fistula, and if it be not already indurated and very chronic we may hope for a gradual recovery. In the alternative the use of the catheter must be supplemented by some of the modes recommended in the received text-books.

The following case, illustrating some of the difficulties which surround the treatment of stricture, will be found of some interest.

CASE LXIV.

Stricture.—Difficulties in reaching the Bladder.—Successful Result.

The patient was a man in business which required much desk-work, and which was always accompanied with much mental anxiety. His age was between thirty and forty. He was married, and had children. His disease supervened on chronic gonorrhœa of long standing, and in its progress various attacks of distressing irritability of the bladder, occasionally terminating in retention of urine, seized him. There was some discharge from the urethra, but as regarded his general health, it was excellent. He was enabled to enjoy life, and deprived himself of none of its comforts.

Sexual intercourse was almost daily indulged in, and without much inconvenience. Perhaps a passing twinge along the urethra, or frequency in passing water, was the result; but generally, little was suffered from it. More frequently, a sudden change in the stream would suddenly occur, and with it forcing and straining to pass water, which ultimately ended in retention. For this he had been treated with silver instruments which he stated passed into the bladder, but with much forcing and pain. He had now some immunity from suffering, and desisted from any treatment until about four years back, when, on account of one of those sudden attacks of retention of urine, I saw him for the first time. Both general and local symptoms of it were marked, and I was not disposed at the time to introduce an instrument. However, learning that under such circumstances the partial introduction of an instrument always relieved him, I took No. 6 gum-elastic, attempted to enter the bladder, and found the urethra slightly obstructed about four inches from the orifice, and again completely about the region of the bulb. I had recourse to smaller instruments with equally bad success; but having with a conical one entered the stricture in one of the paroxysms, I gradually withdrew the instrument, when a forcible gush of urine escaped and completely relieved him. The penis was in a state of perfect rigidity during the paroxysm, and I may add I never found it wholly flaccid. Some camphor julep, with hyoscyamus and tepid ablution, was directed, and under its use symptoms returned to their ordinary state. At extremely

irregular periods this gentleman called on me, in the intervals enjoying excellent health, and indulging in the usual luxuries of life without any interruption, and without further injurious result than an occasional attack of irritability of bladder or retention of urine, which he relieved by the self-introduction of the smallest bougie into the seat of the perinæal stricture, and its slow withdrawal. I cannot say that at any one sitting I fairly entered the bladder, and I tried every position, and every form of instrument. The only palpable local good effected was the removal of the anterior stricture. It was yet surprising to me that an expression of decided benefit was always given after those attempts; and as soon as the immediate irritative effects on the urethra passed off, there was a term of great comfort, variable as to duration but always marked. This gentleman had occasion to go to London, and consulted Sir Benjamin Brodie, but that distinguished surgeon did not succeed in introducing an instrument. I should remark, however, that he had only the opportunity of examining the urethra on one occasion, and at that special time the seat of stricture was morbidly sensitive, which most probably prevented him from much interference. Writing to me, Sir Benjamin suggested the application of nitrate of silver by means of a bougie, or the introduction of full-sized metallic instruments every other day, these to be pressed steadily against the stricture for a few minutes.

The second suggestion was attempted to be carried out, but the slightest improvement only tended to

insure a total disregard of any systematic attention ; so that both surgeon and patient were again doomed to disappointment. However, the morbid sensibility of the parts was removed by it. The stream of urine materially increased, and the attacks of retention were at longer intervals, but no substantial improvement was effected, and the bladder was not entered.

Next year this gentleman took the opportunity of leisure, visited Paris, and applied to M. Civiale. During eight successive days he attempted to reach the bladder and failed. He used a variety of instruments of a soft, flexible nature, but the bladder was never entered. In Paris the patient lived very freely and did not feel any injurious result, beyond that uncertain condition in the stream of urine and the tone of the bladder, which characterised his case throughout. On his return I again attempted several times to pass a bougie, but by no manœuvre could I do more than reach the stricture, and yet urine escaped with freedom on the removal of the instrument from the urethra. Harassed by these repeated failures, it occurred to me that the point of the instruments caught in a false route in the anterior part of the canal as it passed under the pubis. As I could not at any time detect any deviation from the proper track in the perinæum, I believed that if I could give a direction to the instrument whereby its extremity would be kept accurately applied against the posterior wall of the urethra, I might succeed. I could not understand the varying stream of the urine, and that often, at the period of

application to me, the stream was good, and continuous until the bladder was emptied.

I took an ordinary conical bougie, about No. 1 at point, gradually enlarging to No. 6. I adopted an expedient which will be found most valuable in many cases. I put a drop of red sealing wax on the under part of the thick end, so that I was enabled to observe and correct any deviation of the instrument from the route intended. Introducing it with the concavity towards the scrotum, I kept it steadily but gently progressing, and never allowed it to turn. It passed with almost perfect freedom into the bladder, giving a slightly painful twinge as it entered the ordinary seat of obstruction. I left it in the bladder for about twenty minutes, and on withdrawing it there was no appearance of any blood, and the urine passed off in a good stream.

I substituted a catheter for the bougie at the next attempts, and never failed. Gradually the size was increased, and the patient slowly improved, although, as has been stated, he was most restless and careless.

Retention of urine is one of the most ordinary conditions with which we have to deal in cases of stricture. Almost invariably it can be relieved by a warm bath, and a good dose of laudanum, a tobacco stupe, or by the catheter, should simpler means fail. The relief of the bladder by tapping, either through the rectum or above the pubis, is a recognised operation, but the demand for it appears to me to be very rare

indeed. In this city the operation has, in my experience, been but seldom performed. The case must be a very extreme one to demand it, and I am strongly of opinion that the only condition requiring it is laceration of the urethra from some form of violence.

It is a curious fact that the supra-pubic is the operation which has been and as yet is the proceeding selected by surgeons in this city and throughout Ireland, as far as I can learn, and that in London the rectal puncture is preferred; but I am at a loss to know what is the cause of this. I have certainly seen the operation performed, when I think some further trial of less severe methods would have been successful. I have only found it necessary to perform it twice during a very extended practice. The cases are as follow:—

CASE LXV.

Stricture.—Retention of Urine.—Bladder tapped in the Supra-pubic region.—Recovery.

The patient was the subject of a passable stricture in the region of the bulb; but retention of urine having occurred, he applied at another hospital, where prolonged efforts to reach the bladder with a catheter failed. I was no more successful now, the stricture not yielding to the usual palliative means. An attempt to reach the bladder through the urethra having failed, I substituted supra-pubic puncture, with immediate relief to the sufferer. Twenty-four hours after the operation I saw him. He was quite free

from suffering, and the urine had freely escaped by the canula which had been passed through the wound. The man stated also that urine came from the natural passage. The canula was removed on the second day, and the patient recovered.

CASE LXVI.

Retention of Urine.—Inability to pass Catheter.—Bladder tapped in Supra-pubic Region.—Relief.

A gentleman, aged fifty-five to sixty, was attacked with retention of urine, having the additional misfortune of mental alienation. There was a difficulty in introducing a catheter, and his unsteady movements rendered it ultimately impossible to succeed. The bladder was enormously distended above the pubis. The catheter entered into a pouch in front of the prostate and gave exit to some gelatinous material, very like boiled sago, as is occasionally found in encephaloid disease. No urine escaped. The unfortunate man was in agony. There was no alternative: the bladder was punctured above the pubis, and for the few days he survived great relief was given.

Some cases of retention of urine have come under my notice which have led to grave errors of diagnosis, and have given rise to much alarm. I have been asked in consultation to see cases of which the following is an instance. A gentleman had a large tumour in his hypogastric region, somewhat on one

side of the mesial line. It had been regarded as malignant, but after a careful examination I came to the conclusion that it was a distended bladder. The history and symptoms of the case did not satisfy me as to the malignant character of the affection. I introduced a catheter, and succeeded in withdrawing a large quantity of urine, which was followed by the subsidence of the tumour.

This condition was in some instances associated with stricture, and I could only account for it by supposing that a partial atony of the bladder had been slowly produced, that condition prevailing after the bladder had been emptied to a certain point. The fact that there was no incontinence of urine, or vesical irritability, diverted attention from the urinary organs, and in this way the medical men who saw these cases were not unnaturally deceived. In connexion with this reference to abdominal tumours, it is well to remember that sometimes a large collection of menstrual fluid, owing to an imperforate hymen, or a prolonged sacculum from the bladder, extending towards either iliac region, may simulate growths in such a way as to produce perplexity and alarm. A young woman, aged twenty, ten months married, had obscure pains, an abdominal tumour and other symptoms which led her to believe that she was pregnant. She had never menstruated, but had all the periodical sensations. She had some irritability of bladder, and complained of a fulness between the labia. The abdomen was occupied by a pyriform tumour reaching to the umbilicus. Near its base were two moveable bodies, irregu-

lar, solid, and as large as a hen's egg. There was a conical projection at the entrance of the vagina, leather-like, and made tense by pressure on the abdomen. The bladder was found to be empty, and a trochar having been introduced into the tumour at the vaginal orifice, exit was given to a pint and a-half of dark fluid, like treacle, but without any odour. The prominence in the abdomen disappeared simultaneously with the evacuation of the fluid. The two bodies referred to were the ovaries. The patient was treated in the ordinary way, menstruated in six weeks, and in due time became pregnant.

The following case illustrates the difficulties which may arise in sacculation of the bladder.

CASE LXVII.

Stricture.—Obscure Symptoms.—Sacculated Bladder.—Peritonitis.—Death.

The patient was a policeman, aged about thirty-six years. He was a pallid-looking man, but in other respects appeared to enjoy ordinary good health, and to be equal to the performance of his usual duties. For two years he laboured under symptoms of urinary irritation, which were supposed to be produced by stricture, and which were treated as such: yet on examining the urethra, a No. 10 catheter passed with ease into the bladder. His prominent complaints were frequent, urgent, and painful desire to pass water, and various neuralgic sufferings in and about the region of the bladder. He did not note any uneasiness in the

lumbar region. The quantity of urine he passed was natural, but it was generally loaded with a deposit of a thickish and tenacious character. Whilst under treatment he was so relieved from his principal troubles that he resumed his duties, and remained well for three months, still suffering however from more or less vesical irritation. Then all his symptoms returned with intense severity, and he was re-admitted into hospital, labouring under symptoms of peritonitis. During his stay in hospital he suffered chiefly from attacks of retention of urine; and the peculiarity of these was, that a very small amount of urine was carried off by the catheter; but even from this the relief was so great, that the demands for the repetition of the operation were constant, the sensation of fulness from accumulation of urine in the bladder being almost persistent. There was a tumour discernible above the pubis, but its outline was unsatisfactory. The prostate gland was not enlarged, and no fulness was to be felt in the rectum. The man died of chronic peritonitis, and the condition of the urinary organs was particularly investigated. The ordinary appearance of peritonitis was visible, and towards the pelvis was more intense. In the *cul de sac* behind the bladder there was a gangrenous patch, or what appeared at first to be a distended bladder which had given way. Here a large pouch, as if growing from it, occupied the whole cavity of the pelvis, displaced laterally the rectum, and tilted upwards and rather towards the bladder, which was small and contracted. At the lower and back part of the pouch, a sloughy opening pre-

sented itself. The removal of the urinary organs admitted of more close examination of them. The kidneys were healthy: the left ureter was dilated near its connexion with the bladder, and the latter contracted, thick-coated, and irregular on the mucous surface, as usually presented in its chronic affections. At its back part towards the fundus, was a circular opening admitting No. 14 catheter, perfectly smooth and lined with mucous membrane. This led into a large adventitious pouch, similarly lined, but wholly devoid of any trabecular arrangement. It held half a pint of fluid, and was larger than the bladder. Foetid urine, mixed with pus, mucus, and sloughy shreds, lay partially confined in it, and intermixed were found some irregular lithic acid calculi. In the neighbourhood of the sloughy patch alluded to, the lining of the cavity presented somewhat of an ulcerated surface.

CHAPTER VIII.

ON SOME DISEASES OF THE TESTICLE, SCROTUM, AND ROUND
LIGAMENT.

IN the succeeding pages I give the notes of a few cases of diseases of the testicle, scrotum, and round ligament, which may be of some interest to the practical surgeon.

CASE LXVIII.

Hydrocele of Tunica Vaginalis, extending within the Inguinal Canal.—Partial Retention of Urine.

A stout labourer, apparently in perfect health, and aged about twenty-one years, was sent to me from the country, complaining of much difficulty in passing his urine, and referring to a swelling in the scrotum as the cause of it. He stated that about four months previously he observed what he considered to be a slight enlargement of the left testicle. The swelling he described as soft to the touch, and situated chiefly in the lowest part of the scrotum. As the enlargement was inconsiderable and unattended by pain, it did not cause him any anxiety at the time. After a few months, however, he became alarmed at the rapid growth of the swelling, which was accompanied by pain and difficulty in micturition, and more or less straining. On examina-

tion I found an irregularly ovoid tumour occupying the side of the scrotum, and extending along the cord beyond the site of the external abdominal ring, within the inguinal canal, and here becoming constricted so as to acquire somewhat of an hour-glass shape. It had a uniformly tense and semi-elastic feel, and gave to the fingers, on percussion, a faint sensation of fluctuation. The integuments covering it were but slightly changed in colour, being of a somewhat dusky red, with a few large veins ramifying through them. On elevating the tumour it appeared to glide beneath them, in a manner different from what would be expected in a hydrocele, and it communicated to the other testicle, which lay at its right side and upper part, a peculiar rolling motion. The tumour measured, from its uppermost portion in the canal to its lowest part below the testicle, between six and seven inches, its tranverse diameter being about half that extent. There was no encroachment on the penis, its ante-scrotal portion being perfectly free.

Upon a superficial view this scrotal swelling bore a striking resemblance to an inguinal hernia, being traceable within the ring, and the constriction below seeming to indicate the line of demarcation between the hernial tumour and the testicle, which was distinctly traceable at its lowest part. The absence, however, of impulse, the history of the case as detailed by the patient, and the possibility by careful manipulation of isolating the cord above the tumour, were sufficient to prevent it from being confounded with a hernia, whilst the shape of the tumour, and its translucency by light (as well as from its position

these could be ascertained), served to establish its differential diagnosis. I considered it to be a form of hydrocele to which I had on previous occasions drawn attention, in which the hydrocele grows up, as it were, within the inguinal canal, and so tends in some cases to render diagnosis difficult in the first instance, and entails on the patient a subsequent liability to hernia if not carefully watched and guarded against. Here I treated the case as an ordinary hydrocele, and removed not less than eight ounces of fluid of the ordinary character. Subsequently all uneasiness ceased, and in a week the man left the hospital, with every prospect of permanent cure. In fig. 3, Plate VIII., there is a tolerably faithful outline of the appearance presented.

CASE LXIX.

Large Double Encysted Hydrocele of the Testicle.—Urinary Irritation.

A man, aged seventy years, applied at the Richmond Hospital for a truss for a supposed inguinal hernia. He had been wearing an instrument for a long time. On examination it was manifest that the patient was suffering from an encysted hydrocele on both sides. In the more advanced stages of this disease, when the tumour has reached the size represented in fig. 2, Plate VIII., it may perhaps deserve the name of encysted hydrocele of the cord. The tumour in this case, however, simulated a scrotal hernia in the position of the testicle, which was placed at the lowest part of the

EXPLANATION OF PLATE VII.

- Fig. 1. Section of the testicle, showing its condition in the advanced stage of acute orchitis following gonorrhœa.
- Fig. 2. Encysted hydrocele mistaken for hernia.
- Fig. 3. Hour-glass-shaped hydrocele of the tunica vaginalis.
- Fig. 4. Section of testicle showing tubercular deposit.
- Fig. 5. Double orchitis in the infant, followed on the left side by "granular testicle," or benign fungus.



FIG. 2.



FIG. 3.

FIG. 4.



FIG. 5.



MR FLEMING

ON DISEASES OF THE BLADDER AND URETHRA IN CONNEXION
WITH THOSE OF THE TESTICLE.

scrotum ; but the possibility of isolating the abdominal ring, and the distinct evidence of fluid in the sac, pointed to hydrocele. I tapped the tumour, and drew off about 14 ounces of milky fluid loaded with spermatozoa.

The fluid secreted in such cases has been compared to the milk of the cocoa-nut, and usually contains a large quantity of spermatozoa—a circumstance which I have never observed in the ordinary hydrocele of the tunica vaginalis. Several hypotheses have been advanced to account for their source ; but I am rather inclined to adopt the view of Paget, who believes that a cyst possesses the power of forming material resembling that of structures in its immediate vicinity. I have moreover seen a few cases of tubercular testicle in which there was a thick creamy fluid in the cavity of the tunica vaginalis. Thus in some cases of lacteal tumour the contents of the cyst have all the appearances of milk. Mr. Curling, however, does not accept this view.

CASE LXX.

Granular Swelling, or Benign Fungus of the Testicle in Infants.

An infant, fourteen days old, was brought to hospital with acute inflammation of the left testicle. No cause could be assigned for the attack. The health of the child appeared to be perfect, and there was no trace of eruption of any kind. The mother, who was a healthy-looking woman, said the attack had com-

menced some days previously, with fulness and tenderness of the scrotum. The inflammation was now intense. The scrotum especially was very much inflamed and prominent in front of the testicle, which, with the epididymis, was so much enlarged as to equal the size of a hen egg, and the cord was thickened and painful on pressure. During the progress of the case there was considerable urinary irritation, at one time amounting to retention, and requiring the introduction of a catheter. The woman would not remain in hospital, and her poverty did not enable her to carry out fully the directions given her. At the end of a week a slough formed on the most prominent part of the swelling. When this had separated, a growth protruded through the opening, increased to the size of a large hazel-nut, and ultimately assumed all the characters of the ordinary granular swelling of the testicle. (Fig. 5, Plate VIII.) This gradually disappeared under treatment, and when the child was last brought to hospital the scrotum, the testicle, and the cord were gradually assuming their normal characters.

Numerous instances of affections of these parts in children have come under my notice. Limiting my remarks to the subject of orchitis in infancy, I may say that seldom or ever does a month pass without my seeing such a case in its acute or chronic form, and involving one or both testicles. This case is deserving of record, as well on account of the early age of the child as of the rapid progress and peculiar termination

of the disease. In child or in adult, acute orchitis seldom terminates in even a disposition to "granular swelling"—it is rather the exception than the rule that suppuration takes place; and when this happens, the reparative processes are too quickly accomplished to admit of that morbid growth.

In the majority of instances of chronic orchitis, an induration of the body of the testicle and of the epididymis, as in the adult, continues for a variable time, and gradually subsides under treatment. In other cases this hardness is accompanied by effusion into the cavity of the tunica vaginalis just as in the adult, constituting what has been termed hydrosarcocele, also amenable to treatment. In the third class suppuration will supervene, will pass through its ordinary stages, but will not end in this granular swelling of the testicle unless from great local neglect. In the treatment of such cases all undue pressure should be avoided, especially in the inflammatory stages, and thus the integrity of the delicate structure of the scrotum and of the investments of the testicle will be protected. Destruction of a portion of the scrotum must otherwise result, in the first instance; whilst later on, a fungus merely superficial may be converted into that deep form in which the proper structure of the organ is involved.

Mr. Curling, in his admirable work on Diseases of the Testicle, has been kind enough to insert some remarks of mine respecting the granular swelling of the testicle in the infant, a case of which he had not seen until shown to him by me on one of his visits to

Ireland. I refer to those remarks both for the history of the symptoms detailed, and for the treatment to be adopted.

I will merely add that I am inclined to the opinion that those passing seizures of orchitis which occur in the infant, and which are accompanied by urinary irritation, may be associated with more or less of derangement in the condition of the urine. Minute particles of red sand, or, at that age, more properly speaking, of whitish sand, or small calculous concretions passing along the ureter or the urethra, would account not alone for the affection of the testicle, but for the abdominal griping pain, nausea, and vomiting, so constantly attendant on these attacks; and this is the more probable because morbid conditions of the urine, where uric acid is in excess, are by no means an unfrequent occurrence in child life.

CASE LXXI.

Tubercular Disease of the Testicle.

A constabulary pensioner, aged fifty-seven years, was admitted into hospital in a moribund state, and died in forty-eight hours afterwards. For two years he had been suffering from cardiac and hepatic disease, with recurring attacks of jaundice. Some days before his admission he had been drinking, and had sexual intercourse. It was followed by agonising pain in the testicles, but especially the left, accompanied by a sensation of bursting. There was exquisite tenderness of the scrotum, accompanied by the ordinary

symptoms of acute orchitis, and difficulty of micturition. There was general jaundice, extreme dyspnoea, feeble, almost imperceptible, pulse, and much prostration. After death, the heart, liver, and kidneys were found to be hypertrophied, with tubercular deposit limited to the testicle and the prostate gland, as exhibited in fig. 4, Plate VIII.

CASE LXXII.

Orchitis terminating in Suppuration.—Pus in the Cavity of the Tunica Vaginalis.

A labourer was admitted to hospital, with a somewhat globular swelling, occupying the right side of the scrotum, and involving the corresponding testicle and epididymis. It was about the size of a large orange, was uniformly smooth on its surface, and had a tense, elastic feel, communicating a sense of fluctuation especially in its anterior part. There was no special tenderness on pressure. The scrotum, at its upper portion towards the cord, was puckered and thickened. Here two fistulous openings gave exit to a heavy, foetid, greenish discharge, increased by pressure. Two years ago he was hurt in the testicle, but under treatment the symptoms subsided, and only some fulness remained. Recently he was struck on the testicle with a spade-handle. This was followed by inflammation and swelling, which did not yield to treatment. Two months later the swelling "broke." He had no urinary irritation or discharge of any kind. In the testicle on the left side near the epi-

didymis there was a hard nodule about the size of a playing marble, with a central yielding point of fluctuation.

A probe passed through the sinus on the right side reached towards the epididymis. I could not find any transparency in the swelling, but fluctuation was distinct; and on making further pressure in different situations I could not discover in the anterior and middle portions any resisting substance. I accordingly introduced a trochar as for ordinary hydrocele, and gave exit to four ounces of pus. Now passing in a director, I divided the portion of the scrotum intervening between this point and the opening above, when the cavity of the tunica vaginalis presented itself as the bed of the pus—its colour and polished surface being natural. A further collection of pus was found posteriorly in a pouch distinct from the tunica vaginalis, and reaching to the back of the testicle in the situation of the epididymis. This I laid open freely, and then dressed with turpentine to control the rather smart hæmorrhage. The result was satisfactory, and the patient soon left hospital convalescent. The nodule in the left testicle remained unchanged.

CASE LXXIII.

Secondary Orchitis terminating in Diffused Suppuration along the Cord and Inguinal Canal.

A writing clerk, aged twenty-seven, was admitted to hospital, with chronic orchitis, two sinuses ex-

isting on the left side of the scrotum, one above and one below. The openings discharged freely a foetid, yellowish matter, which was much increased on pressure along the cord. Below, the sinus passed towards the epididymis, which was much thickened and hardened; and above, it was traceable along the corresponding cord into the inguinal canal. The testicle had a slightly nodulated feel, and that upon the right side had a like irregularity towards its epididymis. This man had contracted gonorrhœa eight years ago, and, having been cured, again contracted the disease. He neglected its treatment, and after a gleet of four years' duration, the left testicle inflamed. Pus made its escape spontaneously. Efforts were made to close the openings, but in vain. When I saw him he was anæmic and much emaciated. The inguinal glands were enlarged, and flexion of the thigh was painful and limited. A probe passed freely under the abdominal muscles, where it was evident that pus had burrowed.

The strumous character of the case was obvious, and the treatment had reference to that condition. As regards the local treatment, the free opening of the sinuses, the introduction of sponge tents, the injection of different lotions, and the systematic application of compresses, constituted the principal means adopted. Temporary benefit was obtained, but there was frequently recurring suppuration. Subsequently he passed from under my notice, but I saw him under another surgeon's care, suffering from benign fungus.

The peculiar termination of the inflammation in each of the preceding cases was evidently dependent upon the character of the constitution. It is a complication met with in the accidental and secondary forms of chronic orchitis; but in these cases the course of the suppuration constitutes a rare feature. To the pathologist the condition of the tunica vaginalis in the first case, and in connexion with the subject of purulent effusions into serous sacs, must be interesting. The first point of the suppurative process was in the connective tissue of the epididymis in each case. In the first, the inflammation being of a more healthy and circumscribed character, an abscess formed and burst into the cavity of the tunica vaginalis. This communication took place as in the usual progress of abscesses, or through a fraying of the membrane; or it may have escaped by a rent or crack, as in the bursting of an aneurismal sac on a serous surface. The protective influence of the healthy tunica albuginea is worth noting, confirming as it does the value of a pathological law already established—that the testicle may remain intact although absolutely imbedded in the midst of highly inflammatory processes. In the second case, the tunica albuginea, and ultimately the testicle, were implicated, treatment being unavailing. In either class of cases, indeed, surgery cannot boast of a substantive cure, although it may effect substantive good.

CASE LXXIV.

Cystic Tumour of the Scrotum.—Operation.—Recovery.

A healthy-looking country boy, aged nine years, was brought to the hospital with a tumour of the scrotum. It occupied the left side, was about the size of a large grape, was uniformly smooth on its surface, had a slightly bluish nævus-like hue, and was perfectly translucent. It lay on the corresponding tunica vaginalis, floated freely over it, and could be raised from it with the most perfect ease. There was not the slightest pain or uneasiness. The origin of it was traced to a bruise received while riding, about two months previously, but no mark of injury was visible at that time. It had already been treated without success, and was increasing in size. I transfixed the tumour with an acupuncture needle, when a coffee-coloured fluid escaped, partly externally and partly subcutaneously, and the fulness subsided. A cooling lotion and gentle compression were prescribed, and the boy was allowed to return home. Two months later he again appeared. The tumour had recurred after a short time, and was now about the size of a walnut. It had acquired a sort of sacculated or lobulated form, and there was much tension. The child was admitted, and a few days afterwards I twice passed through the tumour a needle armed with worsted, but without making any attempt to tighten the thread. There was rapid local inflammation, accompanied by fever of the worst irritative type, and although these symptoms were relieved by the removal of the sutures, they were not removed.

The integuments of the scrotum, penis, inguinal and hypogastric regions assumed the characters of phlegmonous erysipelas, with much sloughing of the cellular tissue. For three weeks the case excited the gravest apprehensions, but the symptoms gradually subsided, and the boy left hospital with every prospect of a permanent cure.

Mr. Curling regards cystic tumour of the scrotum as a very rare form of disease, and I have placed the foregoing case on record as it in my opinion constitutes an excellent example of the affection. It is worthy of note that the case of Mr. Crompton, of Birmingham, was a boy of eight years when the disease first manifested itself, an age corresponding to that of my patient. A consideration of the progress of that case induced me to adopt the summary treatment I selected, as I felt that in the interval between the boy's first and second visits to me, the proliferous character of the cyst was being developed. Cysts of this nature are not so rare along the cord, or at the upper part of the epididymis: I speak of those which are distinct and detached, and which can almost be rolled under the finger, in the loose areolar bed in which they lie. I regard them as distinct from the forms of encysted hydrocele occurring in those localities.

The proper treatment I am not fully convinced of. I have acupunctured them, and irritated the inside of the cyst with the point of a needle. I have performed subcutaneous section, and have tapped and injected

them. The result of each has been uncertain. I have seen one excised by one of our ablest surgeons, with almost fatal results. I cannot be an advocate for the seton, even if only retained for a few hours, as in the above case: moreover, the very delicate structure of the scrotum, and its attenuated condition, almost necessarily resulting from the growth of such a cyst, must render more than questionable the treatment recommended by Sir B. Brodie, in similar affections of the female breast. The experience of other surgeons may, however, be more favourable than mine.

CASE LXXV.

Encysted Hydrocele of the Round Ligament.—Injection with Iodine.—Cure.—Subsequent Hernial Protrusion.

A healthy-looking countrywoman, aged thirty to thirty-two years, mother of four children, applied to me for a truss. On examination I found all the appearances of an oblique and complete right inguinal hernia. The swelling had first shown itself about six months before. It could not be attributed to any special cause, was slow and painless in growth, and the exact situation in which it began had not attracted her attention. In the horizontal posture the tumour disappeared, until within the preceding week, during which it had increased in size and become fixed. The bowels were regular. The tumour filled and distended the inguinal canal and the corresponding portion of the labium, so as to encroach on the mesial line. It was somewhat cylindrical in shape, though larger be-

low than above, unvarying in position and size, which was about that of a large goose-egg. It was remarkably tense, free from tympanitic resonance, and in its lower portion there was a distinct sensation of fluctuation. Its transparency could not be ascertained. It received an impulse on coughing, but rather as if it was jerked forwards *en masse*. At its lowest portion it was most distinctly circumscribed, whilst the abdomen, quite soft and compressible, permitted complete isolation of it above, and rendered the round ligament distinctly perceptible to the touch.

I came to the conclusion that I had to deal with a case of encysted hydrocele of the round ligament. A few days afterwards I tapped the tumour and gave exit to about six or eight ounces of fluid having all the characters of the contents of an ordinary hydrocele in the male. The swelling disappeared, and both abdominal rings could be felt wide and patulous, the intervening canal being nearly effaced by their close approximation. In some days the fluid reaccumulated, and after it had reached about four ounces I removed it, and injected the hydrocele with tincture of iodine. The tumour solidified and was gradually subsiding when the woman left hospital. A hernia, however, developed, and was treated in the ordinary way.

Accuracy of diagnosis in disease forms a most important and necessary element in its successful treatment, and under no circumstances is it of greater moment than in surgery. Inattention to what are

termed commemorative symptoms may occasionally be the cause of mistakes; but these are too often the result of an affectation of that superior tact which we fancy our attainments and experience justify, forgetting that each case of the same disease may have its own special peculiarities and demand special investigation. In no department of science is it more true than in ours, that "presumption and self-sufficiency are solved down by the acquirement of useful knowledge, and men daily become less arrogant in proportion as they become more informed."

This case is a very remarkable and rare one, and its diagnosis very easy when its local features are analysed. The treatment adopted is of interest. The occurrence of hernia will recall the same danger in the male, when a hydrocele encroaches on the inguinal canal. If such a tumour is allowed to increase in bulk, the inguinal canal is more or less effaced, the rings are widened and approximated, and the abdominal walls weakened. So long as it remains, the hydrocele forms a permanent barrier to hernial protrusion; empty it or cure it, and hernia must supervene. Hence the valuable lesson—early and accurate diagnosis: early and accurate treatment.

Before closing these observations I may allude to an affection of the scrotum and penis which I have observed in a particular class of men, viz., wine-bottlers. It is their habit, in pursuance of their occupation, to place the bottle between the thighs, and there to drive the cork home. I have seen several cases in which this practice has set up irritation at a point

where the scrotum joins the penis in front, just as we know that soot causes epithelioma in the scrotum in sweeps. In the cases which have come before me the irritation was followed by abscess which in time burst, leaving an unhealthy, ragged, lupoid-looking ulcer (fig. 3, Plate VII.) These cases have yielded to ordinary treatment, although they are occasionally very obstinate.

CHAPTER IX.

STONE IN THE BLADDER AND KIDNEY.

THE presence of stone in the bladder always excites anxiety in the mind of the surgeon, not lessened by the consideration of the several expedients which may be required for its cure. That the disease is often to be met with in our hospitals must be admitted, if we place in the category the cases in which urinary calculi spontaneously escape through the urethra, or the many instances in which calculi are removed from or through that canal by mechanical means ; but if we limit our remarks to those cases which demand the operation of lithotrity, or that of lithotomy, the infrequency of the disease in this city, and in the several provincial towns of Ireland, cannot be questioned. Indeed, the irregularity with which cases of stone in the bladder appear in our hospitals must have attracted attention ; and it may not be inapposite to remark, both in reference to the infrequency and irregularity of their occurrence, that, a century ago, Mr. Dease, one of the ablest surgeons and most successful lithotomists which this, or perhaps any country, ever produced, makes the statement, that in so large a city as Dublin, then containing a population of 200,000 inhabitants, there had not been one operation for stone for nearly two

years, and that for four years subsequently there were only three cases of lithotomy. Moreover, he observes that the aggregate number of such cases in the course of ten years in all the hospitals then in Dublin, some of which cases were from the country, was only twenty-eight, ten of which were successfully operated on by himself. Although our statistics on this subject are incomplete, yet I believe I should exaggerate if I stated that the average number of cases of stone operated upon *annually* throughout Ireland by lithotomy or by lithotrity in our various hospitals or infirmaries has exceeded twelve, ever since the period alluded to. Not a few of these cases have, of late years, fallen under my care, whilst surgeon to the Richmond Hospital, and have been the subjects, some of lithotrity and others of lithotomy; and as such cases rank amongst the most important in operative surgery, and possess, in their progress and results, great interest, the selection here made from amongst them may be found practically valuable.

I commence with those of lithotrity.

CASE LXXVI.

Stone in the Bladder.—Characters of the Urine.—Operation of Lithotrity.—Peculiarities and Nature of Detritus.—Sudden and Violent Hæmaturia.—Recovery.

A man, aged between fifty and fifty-three years, a carpenter by trade, applied at hospital, with much urinary distress, supposed to be attributable to prostatic disease, the symptoms of which had existed for

more than two years. His appearance indicated good bodily health. The irritability of his bladder was very great; the pain was considerable, and was most intense when the last drops of urine were being discharged. He complained of a constant uneasiness in the fore-part of the penis, with a scalding sensation in the urethra, which obliged him almost incessantly to squeeze and compress the organ. There was often a sudden stoppage to the flow of urine, when his paroxysms of pain became particularly severe, and these were equally so on any rough movements, in walking or in driving. Pain was chiefly limited to the region of the bladder and rectum; there was occasional tenesmus; there was no lumbar uneasiness. His urine was muddy and slimy, and had a heavy, disagreeable odour; it was passed at short intervals, in very small quantities, but reached an average amount daily. He mentioned that he had been repeatedly sounded for stone, and that none could be detected.

The bladder was examined, and notwithstanding the adoption of every expedient I failed to find any evidence of the presence of stone. There was a solid, dull sensation communicated on moving the sound in the bladder, but not more than could be referred to the condition of the prostate gland, which was much enlarged. The urine at this time was usually alkaline, or very faintly acid; had a density of 1025; its colour was turbid, its odour foetid, and its deposit viscid and tenacious. Any irritation produced by the examination of the bladder subsided, and the condition of the urine, after a few days, improved. I now intro-

duced an ordinary flat-bladed lithotrite, and gently opened the blades, when I instantaneously caught a stone measuring on the scale about one inch. The same dull sensation was communicated by the grasp of the stone as at the previous sounding. This examination produced comparatively little irritation; the bladder became less intolerant of urine, or of the presence of the sound or catheter; and the condition of the fluid, as regarded colour, reaction, odour, and deposit, was manifestly improved. On examining the deposit under the microscope, in addition to the usual triple phosphate crystals, numerous minute crystals of oxalate of lime were visible, intermixed with spherical masses of urate of soda, having projecting acicular crystals of uric acid attached to them.*

All these circumstances being taken into consideration, viz., the tolerant bladder, the size of the calculus, the good bodily health of the man, and his remarkably placid disposition, I decided upon selecting the operation of lithotrity.

At the first sitting I proceeded in the ordinary way to perform the operation of lithotrity on Heurteloup's bed, drawing off the urine in the bladder, injecting it with tepid water to the amount of about six ounces, and then introducing Weiss's fenestrated lithotrite—No. 14 on the scale in the blades, and about No. 13 in the shaft. I caught the stone, and had three distinct

*Attention to the presence of those spherical masses of urate of ammonia (or soda, as named by some), with acicular uric acid crystals, in certain urinary deposits, such as in the case under consideration, will be useful in the diagnosis of particular forms of calculi.

crushings without removing the lithotrite. There was no perceptible grating sensation, but that the stone was broken was evident, not alone from the presence of detritus within the blades of the lithotrite, but also from fragments which escaped through the steel-evacuating catheter, and from others which afterwards, on its removal, passed immediately with the urine. The amount of suffering experienced was so much greater than I expected, that I regretted I did not use chloroform, and yet I was disposed to attribute much to the large size of the shaft of the lithotrite, which did not allow of its free sliding movement in the urethra. About an hour after the operation there appeared to be some spasmodic efforts to get rid of urine and detritus, but hot fomentations to the hypogastrium and to the perinæum, and an anodyne draught, with hyoscyamus, relieved them. A great deal of detritus passed from the bladder during the three succeeding days, but the constitutional symptoms being mild, I again operated on the third day. A fenestrated screw lithotrite of smaller size was introduced with perfect ease; large fragmentary portions, separating its blades to nearly half an inch, were quickly caught, and three distinct crushings made. A considerable quantity of detritus escaped through the evacuating catheter. No fragments. During this sitting the man was very irritable and restless.

Sunday 21st Oct.—Night spent pretty well, yet annoyed with constant burning sensation in the urethra and penis, particularly in the prepuce and glans; uneasiness about the rectum; passed a considerable

quantity of detritus, with some fragments; much deposit of mucus, with detritus suspended through it.

Third sitting, Wednesday, 24th.—Chloroform, at his desire, administered; effects of it most unsatisfactory; violent automatic movements and complete want of control before anæsthesia produced. Steps of operation as at former sittings, and ordinary bed used. Civiale's scoop lithotrite (Charrière's) introduced, and many small fragments of stone crushed with perceptible grating. Detritus evacuating catheter not used, as much of the fluid injected into the bladder escaped during the effects of the chloroform.

Thursday 25th.—Passed some large portions of detritus, one of which gave great pain; in all other respects better; darting pains through penis less. Mucous deposit in urine as before, portions of it slightly tinged with blood; quantity of urine natural; colour and deposit as noted in fig. 8, Plate I.

Fourth sitting, Saturday, 27th.—Eleventh day after first sitting. Chloroform demanded, and exhibited; same unsatisfactory effects. I introduced a lithotrite, acting by manual pressure, without a screw, but found the fragment of stone caught so hard and unyielding that I could not crush it. I at once substituted Civiale's scoop lithotrite (Charrière's), and succeeded in crushing, with a sharp and audible click, several fragments. No detritus-catheter was used. Treatment as before.

Sunday 28th.—Amount of detritus considerable, and consisting of portions of variable size, some very sharp and angular, others thin and scaly; amongst

them was one very remarkable, being apparently the nucleus of the original calculus, or a distinct calculus. Urine improved ; reaction acid ; no tinge of blood in deposit.

Monday, 29th.—Only a few portions of detritus, which were passed with ease. No impediment to escape of urine, and all pains subsiding. Irritability of bladder less. Appetite and general health good. Urine greatly improved ; reaction distinctly acid ; heavy odour removed. Bark and nitro-hydrochloric acid ; wine.

Saturday, Nov. 3rd.—Walked about a good deal yesterday without annoyance. I examined most carefully, after injecting the bladder, for the presence of any portion of detritus, with sound, with lithotrite, and with the large evacuating steel catheter. I even had recourse to Sir Philip Crampton's glass exhausting apparatus, with his kind assistance, and I failed to discover a trace of any remnant of stone.

He left on Monday the 5th November.

The patient returned in January with hæmaturia caused by an impacted fragment, but this was dislodged, and he recovered (see Case XLVI.)

A month subsequently he called at the hospital, stating that he was perfectly well, and I have from year to year repeatedly seen him since, free from any urinary complaint.

CASE LXXVII.

Stone in the Bladder of a Child.—Character of the Urine.—Operation of Lithotrity.—Recovery.

A healthy boy, aged three years, was brought to the dispensary with most distressing urinary symptoms indicating the presence of stone in the bladder. They had suddenly appeared within a week previously to his application; and the intensity and frequency of the paroxysms of dysuria were extreme. There was almost complete phymosis; the penis was turgid, and the efforts to empty the bladder were most violent.

I had the child placed under the influence of chloroform, and, introducing a silver catheter, I distinctly felt and heard the sharp click of a stone as the instrument entered the bladder. The urine drawn off presented the appearance shown in fig. 1, Plate I., and microscopical examination confirmed its lithic character. Subsequently the child was examined with M. Charrière's "*Brise-pierre*," and the stone ascertained to be about the size of a garden-pea. The usual preliminary treatment of baths, alkalies, and anodynes was adopted for a few days, and lithotrity determined upon. The instrument I selected was the "*Brise-pierre*" already alluded to, whose flat unfenestrated blades corresponded with No. 8 on the ordinary catheter-scale, and its shaft with not more than No. 6. When the child was under the influence of chloroform I introduced the instrument with perfect ease, struck the stone, and caught it. The force required to crush

it was considerable, and the sound elicited was sharp and loud. It was utterly impossible to keep the pelvis at rest during the operation, from the violent straining efforts to empty the bladder, and the occurrence of prolapse of the rectum. Some detritus was removed in the lithotrite, but the evidence of the escape of any subsequently was most unsatisfactory, from the difficulty of collecting it. My impression respecting lithotrity in boys is so unfavourable that I have not since adopted it. This boy made a good recovery, and, when I saw him ten years subsequently, he was in good health, and had never since suffered from any symptom of urinary complaint.

CASE LXXVIII.

Stone in the Bladder.—Rational and Physical Signs.—Characters of the Urine.—Oxalate of Lime Calculus.—Operation of Lithotrity.—Peculiarities of Detritus Fragments.—Recovery.

A young man, aged twenty years, was sent to me labouring under marked symptoms of stone in the bladder, from which he had suffered for very many years. He was of medium frame and stature, and his general health was excellent. Now his desire to pass water was hurried and frequent, and seized him in irregular paroxysms, which were brought on by any rough movements. He did not observe that the stream of urine was at any time suddenly interrupted during micturition, neither did he at the end of it suffer any additional pains. He *never had hæmaturia*,

and any change in the appearance of the urine had not attracted his attention. Such was his condition on his admission into the Richmond Hospital.

There was no difficulty in detecting the presence of a stone in the bladder by sounding, and from the sharp ringing click elicited during the examination, it was concluded that the stone was principally oxalate of lime. The character of the urine tended to confirm this opinion. Its colour was a light straw, its reaction acid, its density about 1020, its odour not disagreeable; its deposit was that of the peculiar semi-transparent tomentous mass* (represented in fig. 2, Plate I.), and there was no appreciable amount of mucus.

The stone was caught easily with the lithotrite, and found to measure about one inch, but any extreme accuracy regarding its size was not attempted, the man being very irritable, and his bladder and urethra equally so. The question of lithotomy could not be entertained, as the patient was determined not to submit to any cutting operation, and indeed, from the large size of the penis, I was not an advocate for it. Lithotrity was hence decided upon, and after some preparatory treatment I proceeded to accomplish it.

On Tuesday 7th May, the first "sitting" took place. I used a common hospital bed, and injected

* When once carefully studied, this condition will be found to be almost conclusive as to the presence of oxalate of lime. Indeed if such specimens of urine be examined, in the recent state, even with the naked eye, under a strong sunlight, minute scintillating points will be visible through the deposit, and these, under the microscope, will be found to be oxalate of lime crystals.

about four ounces of tepid water into the bladder. I now introduced with perfect ease, and with trifling pain, Weiss's improved fenestrated screw lithotrite, of No. 13 size, and at once caught the stone. Getting a firm grasp of it, and drawing the lithotrite forward, I commenced the screw movement. During its working, which required much force, an irregular grating sound was audible, when a loud crack followed, which alarmed me as to the safety of the blades of the lithotrite. This sound was distinctly heard at a considerable distance in the operating theatre. The sound was an abrupt one, unaccompanied by any crushing sensation in the closing of the blades. Again the blades were separated, and during a second screw movement the same result followed. I ceased from any further manipulations, and in about ten minutes afterwards he passed nearly half a pint of urine in an uninterrupted stream, in the erect posture, and with tolerable ease; and there was not visible the slightest tinge of blood. He was ordered a tumbler of hot wine negus, a draught with tincture of hyoscyamus, and a hip-bath.

During the evening he passed water once in large quantity, and without much uneasiness, but with the sensation that the stone was broken, and that the broken pieces were grating against each other, especially during each act of micturition. No detritus had passed.

Wednesday, 8th May.—This morning the pulse was quick, and he had some thirst. The urine was acid, muddyish in colour, and threw down an opaque

deposit, in which very many minute particles of detritus, of a dark colour, were visible. Saline draughts, with tincture of hyoscyamus, were directed, and a hip-bath at bed-time. Under local and general treatment the symptoms subsided, and a second sitting was decided upon.

Second sitting, 15th May.—He was removed to the operating theatre, and placed under the influence of chloroform. Portions of stone were easily and quickly seized, and crushed with varied force—some appearing to fly from under the lithotrite, whilst others were audibly cracked. All this was effected in a short space of time, and without the escape of any urine during the sitting.

In the evening I found that considerable portions of stone had escaped in particles, distinct, angular, and of different sizes, presenting, on examination of the surfaces, evidences of the ordinary mulberry calculus. Some fragments are accurately outlined in fig. 2, Plate XII., nodulated externally, in apparently distinct aggregated masses of globular form, and in size about that of an ordinary garden pea, all being as if cemented together, and covered by snow-white glistening particles of oxalate of lime and triple phosphate. On the outer surface of many of these fragments there was a beautiful appearance somewhat resembling pearl-spar crystals, in some parts being as if transparent, in others opaque, the former being more particularly visible in strong sunlight. The section of many of those fragments presented a laminated and undulating appearance.

EXPLANATION OF PLATE XII.

Fig. 1. Fragments of stone crushed in Case LXXVI. The small isolated calculus at the upper margin may have been the nucleus of the larger mass, or perhaps a separate stone. The weight was 120 grains.

Fig. 2. Portions of calculus which escaped through the urethra in Case LXXVIII. The irregular mulberry surfaces can be recognised with the frosty coating mentioned in the text, and the laminated appearances of the lateral section. The weight was about 180 grains.

Fig. 3. Fragments of calculus in Case LXXIX.

Fig. 4. Six calculi of natural size and shape, removed at a single operation of lithotomy—one of the calculi being broken to exhibit its internal structure and colour.

Chemical Composition of the above.

Analysis by T. W. Grimshaw, M. D.

Fig. 1. Dark portion, oxalate of lime; white portion, ammoniaco-magnesian-phosphate.

Fig. 2. Oxalate of lime, with a slight outer incrustation of ammoniaco-magnesian-phosphate.

Fig. 3. Lithic acid, and lithate of ammonia.

Fig. 4. Lithic acid, and lithate of ammonia.

Tuesday, 17th.—Very large portion, one sharp and angular, and so large as to pass with difficulty through No. 16 on the scale; it escaped by itself after repeated efforts to dislodge it, and was followed by some hæmorrhage. Its edges were sharp, irregular, and laminated, and it evidently consisted of an oblique chip, including much of the outer surface of the calculus. General condition comfortable; sensation that no more of calculus remained; at the same time there was pain in micturition, and especially at the end.

Friday, 20th.—No special complaint; no return of hæmaturia; some more frequency in micturition, and more pain at end of it.

Fourth "sitting," June 6th. Chloroform necessarily exhibited; full anæsthetic effects produced. Bladder not injected, urine having been retained for some hours. Flat-bladed lithotrite, Nos. 14, 15, introduced; many fragments easily caught and crushed; pulverized as much as could be. Warm negus and anodyne draught given before effects of chloroform fully disappeared. Directions to remain in bed, and not to pass water whilst recumbent.

4 o'clock, p. m.—Much detritus, some in large masses about size of small pea escaped without pain or much forcing. Demulcent drinks; to have anodyne and bath at bed-time if required.

12th June.—Such decided improvement in all symptoms that he determined to leave the hospital this day. No detritus during the last two days; no irritability of bladder; no uneasiness of any moment; note of urine satisfactory.

CASE LXXIX. -

Irritable Bladder, with recurring Attacks of Retention of Urine.—Stone in the Bladder.—Character of the Urine.—Operation of Lithotrity.—Nature of the Detritus.—Recovery.

A man, a mason by trade, and aged between sixty-five and seventy years, was sent to me with symptoms of urinary disease, which had distressed him for more than two years. The irritability of his bladder was very great at the commencement, and ultimately terminated in occasional attacks of retention of urine, occurring at irregular intervals. He was now admitted into one of our County Infirmaries, and whilst there was taught to relieve himself by the introduction of a catheter when required. Upon these symptoms, latterly, others very painful supervened; he repeatedly had incontinence of urine, as well as retention, and the catheter often failed to give him relief as before; he required its use more frequently. During its introduction, particularly as it reached the bladder, his pains were excessive, and still after the urine was drawn off he suffered acutely. His urine, moreover, became muddy in colour and heavy in smell.

His journey to town increased in intensity all his symptoms. His urine, as passed at that time, was clouded, feebly acid, in density about 1018, and had a foetid odour. Its deposit, on resting, was opaque; contained urates in large abundance; its supernatant fluid was clear, and there was no al-

bamen. Under the microscope, granular bead-crystals of urate of ammonia were visible in the deposit, intermixed with some tabular plates of uric acid crystals, and some mucous corpuscles, others, apparently pus corpuscles in size and outline, being also present.

The bladder was then tolerant of the presence of urine; the man was in fair bodily health for his age; and the prostate gland was not more enlarged than to be expected at his period of life.

Satisfied of the presence of stone in the bladder, from the rational signs detailed by the man, expecting its physical signs from the account of his medical attendant, and concluding the nature of the calculus present from the character of the urine, I introduced as a sound and lithometer a fenestrated screw lithotrite of ordinary size (No. 14), intending merely to measure the stone if found, and purposing to defer the crushing process until a future day. I at once caught the stone, in the ordinary horizontal position of a patient lying in bed. The click from it was an audible sharp sound; the stone measured an inch or so, and out of the grasp of the lithotrite I could not shake or loosen it by any manœuvre. I had no alternative—I used the screw at once, and crushed the stone. Many distinct crushings of the broken pieces were accomplished at the same sitting, without any difficulty. I had not injected any fluid into the bladder, neither did I now use the evacuating catheter. The bladder bore the several manipulations well, and discharged itself, about twenty minutes afterwards, without much uneasiness, the urine being

mixed with much pulverulent detritus. Any irritation produced was slight, and was easily controlled by mild anodyne treatment.

The daily notes taken in this case would be only tedious to recapitulate, from their great similarity to those already recorded; the several sittings required, and the intervals between them, were nearly the same; the final results, though occasionally interrupted, were equally satisfactory. The man was able to empty his bladder without the necessity of a catheter; he was free from any painful sensation about the bladder, and the urine had gradually acquired a healthy condition. The last fragmentary portion escaping was rather tedious in being removed. It did escape, however, ultimately most satisfactorily. The bladder was injected as largely as it could tolerate, and certainly to the extent of containing at least eight ounces of tepid water. This amount of fluid was thrown in with a gum-elastic bag, provided with a conical-shaped ivory tube, which accurately filled a catheter (No. 8) nearly straight, and with small openings, so that the fluid could necessarily only enter the bladder very slowly. Civiale's scoop lithotrite (Luer's), with the fixed blade hollowed or spoon-shaped, and the moveable one short and abrupt, and bevelled off, was now introduced, and struck the particle of stone, when, by a sharp and sudden turn of the disk, it was caught and pulverized. After this sitting all symptoms of uneasiness quickly subsided, and the man left the hospital in about a week afterwards, free from his former sufferings, and *able to empty his bladder without the neces-*

sity of a catheter. His urine was not as free from mucus as might be wished, but yet it was from day to day improving in every respect. I had a letter from him, two months subsequently, stating his comfortable condition and freedom from his former symptoms, and I have lately heard that he continues well.

The necessity for noting in detail the daily progress of the above cases may be questioned; and yet it is very desirable that the young surgeon, or the advanced student, should be made acquainted with the different steps in many stages of lithotrity. It is an operation of very rare occurrence in our hospitals: and it is desirable to put on record these results observed in them; because they are often the most reliable, and generally the most legitimate fields for clinical investigations. The series of cases reported shows the great value of a knowledge of the possible contingencies on the operation of lithotrity under the circumstances of advanced age, and the varied nature of calculus, apart from other embarrassments. Happy as were the results of these cases, it is possible that their cure might have been more quickly effected, and with perhaps less of suffering, under the present advantages of more modern lithotrity. Its several stages are now much simplified—there is no necessity for a special bed—no preliminary injection of the bladder—no forcible removal of detritus. In fact, the steps of the operation are much simplified, and devoid of any formidable array of appliances. The operative movements are

as rapid as they are almost painlessly performed; and it is not surprising that they should be so, when we consider the improvements made in the mechanism of the instruments required. In none have these been more manifest than in the light and beautiful lithotrites of Weiss and Son, so commonly used at present. Whether fenestrated or not, the improvement made in them, both as regards size and details of construction, are incomparable. They possess the great advantage of retaining the stone or fragments of stone between the blades, during the time of changing the sliding into the screw movements, and this from a provision whereby a slight application of the thumb accomplishes the object, without the necessity of any alteration in the position of the hand of the operator. With their cylinder handles (as suggested by Sir Henry Thompson) they also possess the great advantages that, by a gentle movement of the fingers of the left hand, the most delicate turnings of the blades laterally, or even to complete rotation if requisite, may be accomplished, and moreover, a firm and immoveable grasp of the instrument be taken, by which means the crushing of the hardest stone can be safely secured.

Other advantages derivable from the special form and action of the blades of these valuable instruments must attract attention. It would be out of place here to enter further into the consideration of them. They can be carefully studied, when the effect of the slightest elevation or depression of the handle of the lithotrite, or the deviation from the proper direction

of the shaft, will show the necessity for continued attention on the part of the operator to those minute movements, as indicating the position of the blades, whether closed or open, and as directing their successful application.

A few remarks may be permitted, respecting the position of the patient and that of the operator, the selection of the lithotrite, and its mode of introduction, its manipulation in the bladder, and the removal of the detritus. I prefer that the patient should be placed opposite me, either on a table of requisite height, with or without provision for the elevation of the pelvis, or, as I often find very convenient, at the foot of his bed, arranged with the mattress rolled over the foot rail, or on a sofa, with a small cushion under the buttocks. In the selection of the lithotrite, I am guided by the calibre of the urethra, always providing that the sliding portion of the shaft of the instrument shall have free space for loose movements within the canal, and I select either the lithotrite fenestrated or with entire blades, according to circumstances. If as a lithometer to measure a stone, the blades should be flat, and shaped according to the objects in view; so also if for crushing or pulverising fragments; but, if at a first "sitting," and for the purpose of breaking a stone, the lithotrite must be fenestrated. In the first instance, no accurate measurement could otherwise be taken; in the second, no pulverisation could be satisfactorily effected; and in the third, there could be no security against failure in the fracture of the calculus. During the introduction of the

lithotrite, I latterly always place myself between the thighs of my patient, taking care that they shall be widely separated, and held steadily by an assistant, firmly supported, with the legs and feet properly adjusted. After some trials I find this position preferable to any other, and particularly in cases which have been already treated without satisfactory results. Doubtless, the lithotrite may be introduced as the ordinary catheter, when used as a lithometer, but for lithotritry purposes I prefer the position I mention. I always take care to have the abdomen fairly exposed, so that the umbilicus may be held constantly in view as an unerring guide to the safe direction of the instrument. I pass it into the urethra with my right hand, and press it onwards and downwards towards the perinæum, at the same time drawing forward the penis to the extent required. Having reached the perinæum, I now transfer the lithotrite to my left hand, when, gently depressing its handle, or even allowing it to fall, as if by its own weight, but yet supported, the bladder is immediately reached. In this latter movement I never lose sight of the handle of the instrument, and of its relations to the umbilicus; and I fancy I have often found it a good plan to divert the mind of the patient from this—the most important, and often the most painful step in the operation—by making gentle pressure with the palm of the right hand over the pubic region, or with the ends of the fingers over the perinæum in the site of the angle of the lithotrite, so assisting its onward passage. The amount of depression of the handle of the instrument above

alluded to must be measured by the presence or absence of prostatic disease, or by that of the bar-like ridge at the neck of the bladder. In either case the depression required may be considerable, and in both a certain amount of additional force is necessary to secure the satisfactory entrance of the instrument into the bladder. The depth to which it should be passed, so as to reach the cavity of that organ, will much depend on the same contingencies, and the subsequent manipulations must be conducted with the greatest caution and gentleness. By some surgeons the stone will be seized instantaneously, and in any position of the patient; whilst by others, select what position they may, the greatest perplexities will arise, and very often there will be a complete failure in catching it. I have noted in the history of the cases detailed, that it is well to open the lithotrite, whilst engaged in the operation, to the extent to which the moveable blade had reached on the scale when the stone was first recognized and measured. If this be attended to, it will prevent the partial separations of the blades, which are as useless as they are often most injurious. The directions for seizing and crushing the stone, which are fully detailed and discussed in all the recent works on surgery, are in none more satisfactorily and clearly given than in the fourth volume of Holmes' "*System of Surgery*," under the article "*Lithotrity*,"—which contains all the admirable suggestions of Sir H. Thompson on the subject—suggestions so full of practical value, that a knowledge of them is indispensable to the successful operator.

I have long thought that some improvement was called for in the detritus or evacuating catheter, when the use of such might be advisable, and I give wood-



Fig. 19.

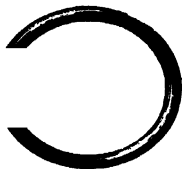


Fig. 20.

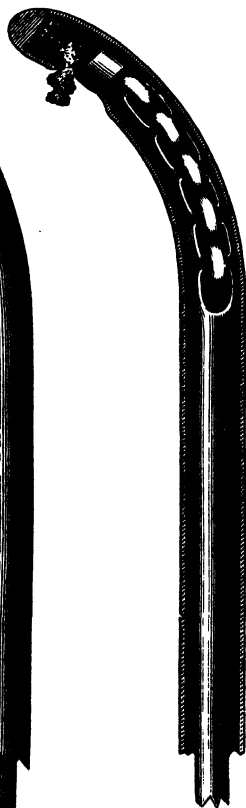


Fig. 21.—Catheter for crushing and removing detritus

cuts of one which I have found useful (figs. 19, 20, 21). The size of this catheter may vary, but to be efficient it should not be under 14 or 16 on the scale. Its

curve is short and abrupt, and one large opening exists on its concave surface, near its distal end. There is a strong stilet, with a ring at one end and

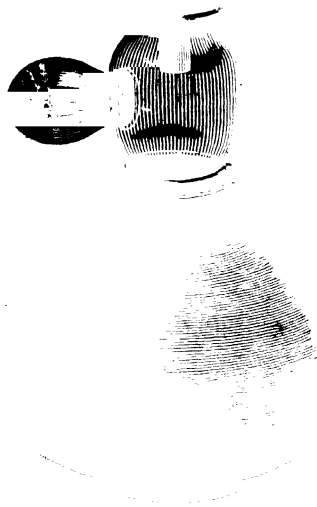


Fig. 22.—Flushing syringe with receptacle for detritus.

a chain attached to a firm pellet at the other. This stilet and chain fit the catheter loosely, and their combined length exceeds that of the latter by an inch or so. The advantages of this instrument I have found to be, that the short curve admits of its extremity being turned safely towards the ordinary situation of detritus in the bladder, and hence that it may be more satisfactorily commanded and influenced by any injection thrown

in. The provisions in the stilet will admit of its pulverizing or clearing the detritus without at the same time interfering with the spontaneous escape of urine or other fluid from the bladder through the catheter. To this catheter may be attached any one of the several varieties of syringes in use, and amongst them that which has been recommended by Mr. Clover, and which may be termed a “flushing syringe.” I have had a wood-cut of this syringe executed, with some trifling additions to it (fig. 22), which may, perhaps, be found efficient. The

little offset from the glass chamber, which I add, tends to secure the removal of such detritus from the changing fluid, whilst the canula provision at the catheter entrance, projecting into the glass chamber, renders it less likely to permit the return of any portion of the detritus into the bladder, through the catheter, in any retrograde movements of the fluid.

The results of the operations of lithotritry above noted have been most satisfactory. The number of sittings in each case to accomplish the cure was very limited, and the intervals between each sitting were as ordinarily practised. As regards the detritus, it was, it may be said, allowed to escape by the natural efforts of the bladder, and no very serious consequences ensued. Indeed, respecting this stage of the operation, I am of opinion that over minute pulverization of any portion of stone has its disadvantages, and I must acknowledge that I am much opposed to the forcible traction through the urethra, although advocated by high authority.

I have been fortunate enough in my practice to see a large proportion of the stone cases which have come under treatment in this city. I have myself operated upon many of them, with good success. In a book which only professes to be a record of some cases, with such commentary as may seem fit, it would be out of place to enter into the details of operative proceedings which are fully described in the systematic works. I will, therefore, here simply give some

of the more remarkable cases in which I have performed lithotomy, making, at the close, some general observations regarding them.

CASE LXXX.

Sudden Retention of Urine from Enlargement of the Prostate Gland.—Deceptive Rational Signs of Stone in the Bladder.—Lithotomy.—Removal, at the Operation, of Six Large Calculi.—Violent Secondary Hæmorrhage.—Recovery.

A man, in his sixty-third year, was brought to the Richmond Hospital, with retention of urine, which, for the first time, attacked him the evening before, after exposure to cold. He was a tall, able man, in good bodily health. For the last four years he had been employed as drayman in an extensive brewery in this city. On repeated occasions, for the last ten or twelve years, he had uneasiness in the loins, extending along the course of the ureters, towards the region of the bladder, and, at irregular intervals, frequent and urgent micturition. The urine was often suddenly interrupted in its stream—but yet, with all these symptoms, he continued to discharge his duties, the attacks passing off after some severe paroxysms, and returning after very irregular and lengthened intervals. He never had hæmaturia, and did not suffer more acutely while engaged in his daily occupations. On no previous occasion had he retention of urine. I passed a gum-elastic catheter, and drew off a large collection of fluid. At the end of its removal I

thought I felt a calculus strike against the instrument, but, at the moment, attributed the sensation to one of those fluttering movements so commonly communicated in such cases. I induced the man to enter the hospital, and on the following day I examined a specimen of the urine drawn off. Its odour was natural—it was of a deep straw-colour, acid in its reaction, and had a density of 1020—its deposit was copious, opaque, and fawn-coloured, and studded throughout with minute red particles resembling Cayenne pepper. Under the microscope, crystals of lithic acid, of all shapes and forms, were clearly discernible; the glass vessel was clouded with a deposit of lithate of ammonia, which gave it a muffed appearance, and caused the fluid to present a deceptive muddiness. The following morning I drew off the urine with a silver catheter, as the man lay in bed, when the presence of a stone in the bladder was unequivocally ascertained. A few days subsequently, before removing the urine, I introduced a flat-bladed lithotrite, and at once, without the slightest difficulty, felt and caught a stone, measuring at least an inch, when, finding some delay in disengaging it from the grasp of the lithotrite, I got the sensation during its movement that another stone was present. Although the instrument passed without much obstruction, it was yet obvious that it required to be pushed to a great length before it fairly reached the cavity of the bladder, and, on examining the prostate gland, a considerable enlargement of it was discovered.

The operation of lithotomy was decided upon be-

cause of the condition of the bladder and the prostate gland, as well as the size of the stone, and the suspicion of the existence of a second. The lateral operation was performed, and a stone was quickly removed, the size of which being under that indicated by the previous measurement, and its shape peculiar, caught my attention, and I passed the forceps again into the bladder, and on five successive introductions caught the calculi (six in all) shown in fig. 4, Plate XII. There was some sharp hæmorrhage, which was quickly controlled by the "canule en chemise," and all proceeded most satisfactorily until the eighth day after the operation, when an alarming hæmorrhage suddenly occurred. I was urgently sent for, and found that all the ordinary efforts had been made by the resident pupils to arrest the bleeding, without success. The wound was filled with coagulated blood; blood was also trickling from it and from the urethra, and there was very severe tenesmus. I cleared out the wound and the bladder of a quantity of semi-coagulated blood, and reintroduced the canula, protected with a collar of dry sponge securely tied round its vesical end, taking the precaution of leaving the openings of the instrument free; I then secured all with firm pressure. Wine, opium, and ice were given, and a temporary control of the hæmorrhage was effected. Again, however, it recurred with even greater violence, accompanied by forcible tenesmus, and the escape of fluid fæculent matter. I now directed, in addition, a piece of ice, shaped as a bougie, to be introduced into the

rectum, when, learning from my pupil that it could not be accomplished, I prepared a piece myself, and finding it obstructed about one inch and a half or two inches from the anus, I passed up my finger and felt *the rectum blocked up with a large accumulation of hardened fæces*. The course of proceeding was now obvious; the fæces were mechanically removed and the rectum well washed out. The hæmorrhage at once ceased, and never recurred, and the case progressed steadily, the use of the catheter not having been required after the operation of lithotomy, and the bladder ultimately *recovering itself completely*.

This man left the hospital free from any urinary suffering, and has often presented himself since that period, no symptoms of his former complaint having recurred.

The deceptive character of the rational signs of stone in the bladder in this case marks the necessity for caution on the part of the surgeon in his examination of that organ where prostatic disease is present.

The value of the manœuvre specified with the object of detecting the presence of more than one stone in the bladder will be admitted, as well as the selection of the operation of lithotomy under the circumstances of the case, while the cause of the occurrence of the secondary hæmorrhage after that operation is specially important to bear in mind.

The weight of the calculi removed, when dried, was more than one ounce and a half: their shape irregularly spherical, but without absolute facets: their

surfaces smooth, and their consistence very fragile. The measurement of each by the lithometer varied from one inch and a half to a little more than half an inch in their respective diameters. Their composition, as already noted, according to the analysis of Dr. Grimshaw, was principally lithic acid with lithates.

CASE LXXXI.

Prolonged Irritability of Bladder.—Condition of Urine.—Calculus.—Lithotomy.—Recovery.

A man, aged twenty-nine years, was admitted into the Richmond Hospital, complaining of pains in the lumbar region, and irritability of the bladder. The stream was small, was occasionally suddenly interrupted, and should be carefully controlled towards the end of micturition, to lessen pain, which was at that time always most acute. He had occasional incontinence of urine, and position materially influenced its discharge, this being accomplished with more ease whilst he lay on the right side than on the left, being utterly impossible in the erect posture, and barely practicable in the sitting. He often experienced in the urethra a burning sensation, accompanied by acute stinging twinges, which were relieved by pressing the glans and the body of the penis tightly in the hand; and in making any sudden exertion, or in walking, he distinctly felt a solid body moving in the bladder. The symptoms were traceable to a period twelve years distant. There was occasional hæmaturia, after any rough exercise. Seven years before, I transferred him to the care of

Mr. Cusack, but he would not then submit to operation, and left the hospital. From that time until within a week of his admission into the Richmond Hospital, I had never seen or heard of him. Then I learned from his sister, who applied to me on his behalf, that up to five months previously he had tolerable immunity from suffering, that he was now gradually emaciating, and that his torture, both by day and by night, was so extreme, he was determined to undergo any operation for relief. He had been married within the last five years, and had three children; he was now a widower, and his habits latterly had become most intemperate. During the first month of his residence in hospital, in addition to the special sufferings notified, he was never free from more or less pain. He never left his bed. He had repeated rigors, and insatiable thirst. During this period particular attention was paid to his urine. The ordinary range of its density was about 1016-18; its colour pale, and appearance wheyish. Its odour was, when first discharged, sour, and its reaction acid. There was always a deposit of rest about three or four lines in depth, creamish in colour, and with its surface linear. In this deposit there were clearly discernible, under the microscope, pus and mucous corpuscles, the latter comparatively few: both interspersed with epithelial scales, and most minute crystals of oxalate of lime. This deposit, even after twenty-four, thirty-six, or forty-eight hours, was perfectly miscible with the supernatant fluid. The latter was quite transparent, almost aqueous, and although becoming opalescent from the application of

heat, it was rather rendered less so than flocculent by the addition of nitric acid. Such was the pathological condition of the urine, with little change, during the whole period preceding the operation of lithotomy, with the remarkable features superadded, that, without any appreciable cause, the amount of purulent deposit was occasionally and rather suddenly most profuse, so much so as to occupy nearly an inch in depth in the test-glass, and this without any ostensible change in the local or general symptoms, or any change in the character of the supernatant fluid as already specified.

About the first week in April, I ventured to introduce a silver catheter of medium size, but on reaching the bladder I was obliged instantaneously to withdraw it, the irritation was so extreme. In doing so, however, I felt the stone. Notwithstanding every precaution I could devise, each subsequent introduction of any instrument was followed by a paroxysm of urinary fever, of more or less intensity. I did manage, however, to steal up to No. 13 on the gauge in ordinary use, and that in a very contracted and sensitive urethra, and now introduced a lithotrite of that calibre, but I could never repeat the operation: it would not be submitted to. On many of those occasions I felt no stone. On the 25th of April, he, for the first time since his admission, walked about the hospital, when he distinctly felt the stone moving, and was struck with sudden pain in the neck of the bladder, and retention of urine, which required the catheter. A few days subsequently, I passed a "sound-gauge," which I procured at Mr. O'Neill's

in Henry-street. Its number at the extreme end was 8, and at the curve 10, and I found the greatest satisfaction in its manipulation.* The sharp click of the stone was distinctly heard. On separating its blades the calculus was caught, and its measurement effected with ease, marking a distance of from one inch and a half to three-quarters on the scale.

He now made up his mind to undergo the operation of lithotomy, and all interference with the urethra and bladder, as regarded the introduction of instruments, was suspended. I came to the conclusion that the calculus was moveable in the bladder; that it was, most probably, mulberry, with lithic acid; that it was a large stone; and that the presence of renal disease was improbable.

The preliminary treatment having been adopted, I performed the operation of lithotomy, and was enabled to use No. 13 staff; the other instruments were those in ordinary use. The full anæsthetic effects of chloroform were very slowly produced. No accident occurred in the operation. Its various stages were accomplished with reasonable rapidity, and the calculus, as hereafter delineated, was removed. The progress of the case throughout was most favourable.

On the tenth day from the operation, a portion of the urine passed along the tract of the urethra; on the fifteenth, little or none escaped by the wound;

* This instrument was evidently devised after the plan originally suggested by Mr. L'Estrange, of this city. It appeared to me to be an excellent instrument for the double purpose contemplated.

and, on the twenty-first, it might be said that the natural course was established. There was a steady improvement in his general health from a few days after the operation. The natural functions of the bladder and urethra were fully restored, all urgency and pain in passing water having totally subsided.



Fig. 23. Oxalate of Lime Calculus.

This woodcut gives an accurate outline of the calculus. It is somewhat of the shape of a walnut, measuring in the largest circumference three and a-half inches, and in the smallest three, and so far confirming the note taken with the sound-gauge. Its weight is six drachms. It is very hard and dense, and belongs to the class of mulberry calculi. On portions of its surface, and in the interstices of the little tubercular eminences, it is as if spangled over with most minute transparent crystals, some of which are, in a strong light, perfectly distinguishable by the naked eye, but most satisfactorily so with an ordinary magnifying glass.

CASE LXXXII.

Retention of Urine.—Stone in the Bladder.—Lithotomy.—Recovery.

A healthy-looking boy, aged five years, was brought to me, whilst some distance from town, with retention of urine. For the last two or three years he was observed to suffer from more or less urinary distress and obstruction. His clothes were constantly saturated with his urine, and latterly there was retention so complete as to require surgical assistance. He was now in great agony. He was dragging at his penis, the large size of which, for his age, was remarkable, and his bladder was distended up to the umbilicus. Finding no evidence of a calculus along the tract of the urethra, I concluded there was one in the bladder, and removed him to hospital, where he was admitted on the evening of the 4th June. I introduced a gum-elastic catheter, and feeling considerable resistance at its entrance into the bladder, by slight pressure overcame it, when a quantity of urine, not less than a pint, was ejected with enormous force, passing along the outside of the instrument in a large and continuous stream. In the withdrawal of the instrument, considerable traction was requisite, and a distinct grating sensation was communicated to the fingers. It is unnecessary to give details of subsequent treatment. The presence of stone was ascertained by the ordinary means, the impression being that it was small, and, from the

manner in which it struck the sound, that it was light. I was anxious, if possible, to learn its size by measurement, but I could get no lithometer of sufficiently small calibre, although I was able to pass, with little force, No. 7 staff into the bladder. The condition of the urine was particularly tested, with a view to the nature of the calculus, previously to operation, and the ordinary state was found as follows:—colour, light straw; density, 1025; reaction, acid; odour, normal. Deposit of a yellowish brown, flocculent, and opaque mass. It is about three or four lines in depth, and on its upper surface there is a brick-coloured stratum. In a portion of this deposit, under the microscope are visible numerous crystals, tabular and otherwise, of lithic acid. They are interspersed with large octohedral crystals of oxalate of lime, with epithelial scales, and pus and blood globules, in small quantities.

The conclusion I arrived at was, that the calculus contained lithic acid, or the lithates, in combination with oxalate of lime.

I determined to remove the calculus by lithotomy, the chloroform producing violent and continuous straining efforts of both bladder and rectum, as in a severe paroxysm of stone, although apparently full anæsthesia was present. I felt the groove of the staff, during these violent efforts, overlapped by the gut, and was obliged to watch an interval of their cessation, both to open the urethra and afterwards to introduce the lithotome. The bladder was now rapidly entered. It contained no urine, and on passing in my finger I felt

the stone at as considerable a distance as in the adult.* With the impression on my mind that it might be very small, and that it might either escape without observation, or be caught with difficulty by the forceps, from the contracted state of the bladder, I attempted to seize it between the end of my finger and that of the gorget, and so draw it forward. In adopting this manœuvre the stone was not, to my sensation, as moveable as I expected to find it, and it occurred to me that it was somewhat encapsuled, as in a case mentioned by Mr. Erichsen in his valuable work. I had recourse to his expedient, and whilst in the position above alluded to, I scratched the surface with the end of my nail until I felt the stone bare. It now

* There is much difference of opinion as to the exact spot for the commencement of the external incision in lithotomy. In the cases reported, I began rather nearer the anus than is usually practised here, and in the child perhaps too near. I was, however, in each case, most anxious to avoid the bulb. In each it was very large as felt through the rectum; and particularly so in the child, the body and glans of whose penis were larger for the age than I have ever observed. Again, the organ was in almost a constant state of erection, and the arteries must have been very considerable. I may remark, that in the majority of instances the urethra in the child is opened too much in front. The lithotome was passed into the bladder, and the subsequent division of the urethra quickly effected. The empty state of the bladder did not appear to me to be inconvenient; quite the contrary. I felt the stone without any difficulty, and I doubt whether the statement of Cheselden on this subject should not tend to check the over-anxiety of those who have recourse to rather cruel expedients to retain the urine.

I would hesitate, even under chloroform, to inject the bladder of the child. In the adult I have seen the injected fluid dashed out with violence under chloroform, in the operation of lithotomy, and I should much apprehend the same in the child. Indeed, in this case I attempted to anticipate the contraction of the bladder, by introducing the staff before chloroform was administered, but it was useless.

slipped away, and introducing the forceps I removed it without difficulty.

There was some slight hæmorrhage after the operation, but none to excite alarm. I deemed it more prudent to introduce the canula. It produced, however, so much distress, that I was obliged to remove it within an hour.

On the ninth day, urine passed along the urethra, and from day to day the quantity increased. On the fourteenth and fifteenth, symptoms of distress supervened, as severe as before the operation was performed; a circumstance which I have often observed at this special period after the operation, both in adults and in children, and which probably is owing to the new function suddenly thrown on a previously irritable bladder.

These symptoms yielded to mild anodyne treatment.

The urine soon passed by the natural route, and the bladder rapidly recovered its functions.

This woodcut represents the outline of the calculus. Its weight is within a grain or so of two scruples. It measures around its largest circumference nearly two inches, and on one aspect there is a sort of nipple-like projection. The colour is a light fawn, and its surface somewhat granular, without any crystalline appearance.



Fig. 24.—Calculus removed from a child.

I had a section made of each of the above calculi. The alternating laminæ of the oxalate of lime and lithic acid variety are most beautifully shown:

the oxalate deposit forming the external coating of the larger; and the lithic, combined with lithate of ammonia, that of the smaller, lithic acid being the nucleus in each. (See Plate II.)

CASE LXXXIII.

Stone in the Bladder.—Lithotomy.—Recovery.

A child, aged five years, was sent to me from the country with symptoms of stone. These had been first noticed two and a half years previously, and were followed by prolapse of the rectum. The symptoms were very marked, and the pain on micturating was so great that he always avoided passing water during the day, if possible. He had incontinence of urine at night. He was often free from pain in the day, and had but little irritability of bladder. He could play as other children, but was occasionally attacked by a paroxysm. The stone having been detected, I operated, and removed a large calculus, as shown in fig. 1, Plate XII.* The stone weighed an ounce, and is remarkable in shape, having a projecting spud. The boy recovered.

CASE LXXXIV.

Stone in the Bladder.—Lithotomy.—Death from Chronic Bronchitis.

A Welshman, between sixty-five and seventy years of age, and with a shattered constitution, was sent to hospital from Holyhead. He had most agonizing suffering from urinary irritation and painful micturition. On sounding him a stone was discovered. It was so large that it could not be fully caught with a lithotrite. The urine was alkaline, loaded with mucus, and had a copious tenacious deposit. Unfavourable as the case was for operation, considering the age of the man and his broken-down habit, it was deemed advisable to give him the chance of lithotomy. The ordinary lateral operation was performed, and the stone delineated in fig. 2, Plate XII.* was removed, with great relief to his sufferings. For three or four weeks he progressed fairly, but the symptoms of bronchitis became more aggravated, and he ultimately sank under suffocative catarrh.

CASE LXXXV.

Stone in the Bladder.—Attempted Lithotrity.—Lithotomy.—Recovery.

A healthy-looking man, a tailor, aged thirty, had for many years symptoms of stone in the bladder, which had been detected by many surgeons previously to his admission into hospital. He had, however, declined operation. His sufferings were most



FIG 1



FIG 2



FIG 3

EXPLANATION OF PLATE XII.*

- Fig. 1.** Lithic acid calculus, with nucleus of oxalate of lime, removed from a boy, aged eight years. (Case LXXXII.)
- Fig. 2.** Mixed calculus removed from a man aged sixty-five to seventy, by lithotomy. (Case LXXXIV.)
- Fig. 3.** Oxalate of lime calculus, studded with nodulated masses. Lithotrity had been attempted, with the result of removing the small portions depicted, but the patient declined to submit to a second sitting, and lithotomy was performed when he came under my care. (Case LXXXV.)

agonizing. He would throw himself on the floor and roll about the room. Micturition was frequent, urgent, and very painful. There was no hæmaturia of importance. The stone was at once detected with a lithotrite, the sharp click indicating its character. At the desire of the patient, lithotrity was had recourse to, and the detritus removed showed that the stone was mulberry. The pain was so great that the patient declined further attempts at crushing. He was then transferred to my care, and I performed the lateral operation and removed the stone shown in fig. 3, Plate XII.*; the small chippings resulting from the lithotrity being also found in the bladder. The result of the case was most satisfactory, the man being now, nine years after the operation, perfectly well.

CASE LXXXVI.

Stone in the Bladder.—Removal of large Calculus by Lithotomy.—Recovery.

A boy, aged twelve, complaining of frequency of micturition, pain at the top of the glans, sudden checking of the stream of urine, and some incontinence, was admitted to hospital. During sleep he passed water, and was observed to be constantly pulling at the prepuce even then. The symptoms had lasted some months. On sounding, I detected a stone about the size of a nutmeg. The urine was of light straw-colour, sp. gr. 1018; reaction acid; deposit semi-opaque, tomentous, with a superficial layer of brick-dust; supernatant fluid tolerably clear. Under

the microscope the deposit consisted of urate of ammonia, oxalate of lime, and some irregular masses of lithic acid. After sounding there was some hæmaturia, but it was only contingent upon this. I performed the lateral operation, and quickly caught the stone. It was of oval shape, roughened by many elevations, and weighed seven drachms. The composition was urate of ammonia and oxalate of lime. No complication occurred, and the patient made a good recovery. (See fig. 25, Plate XIV.)

CASE LXXXVII.

Stone in the Bladder.—Lithotomy.—Oxalate of Lime Calculus.—Secondary Hæmorrhage.—Recovery.

A boy, aged twelve, was admitted to hospital, complaining of frequent micturition, and pain, especially at the close of that act. The pain was influenced by position, being less when he lay on his back, and being greatly increased by any rough exercise or play. The urine was usually muddy, and on some rare occasions there was a tinge of blood. He had suffered for about nine years, having been treated by a surgeon, but without relief. I at once sounded him, and detected a stone. The small size of the penis attracted attention, and also the fact that little, if any, pain was referred to the glans. The density of the urine was between 1011 and 1020; its colour straw; the deposit as exhibited in fig. 2, Plate I.; its reaction acid. I believed the stone to be oxalate of lime. I performed the lateral operation, after the usual prepara-

tive treatment. The top of my left finger at once struck the stone, but it lay in a deep pouch considerably below the level of the opening into the bladder. This rendered the catching of it by the forceps difficult; but I was able to draw it up with my finger, and to bring it within reach of the instrument. It was a mulberry stone, studded with numerous sparkling crystals of oxalate of lime, roughened with many projections, and weighed two drachms (fig. 25, Plate XIV.) The hæmorrhage was controlled by the *canule en chemise*, but it recurred several times the same day, in spite of the removal of the instrument, and its careful re-introduction. I now steeped a sponge in tincture of matico, and passed it well down to the end of the canula, within the chemise, so that some pressure was made. The bleeding was thus controlled, and the patient gradually progressed. A fortnight afterwards he got an attack of orchitis, followed by erysipelatous inflammation of the scrotum, apparently from infection; but from this he also rallied, and made a good recovery.

CASE LXXXVIII.

Stone in the Bladder in a Child.—Lithotomy.—Recovery.

A child, aged three and a half years, was admitted to hospital with the rational signs of stone. He never had hæmaturia. The sensible signs were not satisfactory. After various soundings, I at last caught a stone, which measured from a quarter to half an inch on the scale. I performed the ordinary lateral opera-

tion, and removed a lithic calculus, weighing about thirty grains. The patient made an excellent recovery.

CASE LXXXIX.

Calculus.—Lithotomy.—Failure to find the Stone.—Scarlatina.—Death.

An unhealthy-looking boy, aged six years, was admitted, suffering from urinary irritation. A stone was detected, and the operation of lithotomy was performed. There was no difficulty in reaching the bladder; but I was unable to catch the stone, and after some efforts to do so I desisted, knowing that in such cases the calculus may frequently be found in the wound a few days subsequently. Two days afterwards, scarlatina supervened, and the patient died. The stone was found impacted in the neck of the bladder. It was of the shape and size of an almond, and was composed of uric acid and urate of ammonia.

CASE XC.

Stone in the Bladder.—Lithotomy.—Recovery.

An emaciated, ghastly-looking boy, aged ten years, was admitted to hospital with urinary disease of long standing, during which much pain was endured. The symptoms were so characteristic that I at once sounded, and detected a stone. The impression conveyed to my mind was that the stone was about the size of a walnut. The history of his case was

one of great suffering. He passed water at frequent intervals day and night. I operated on the boy on the same day as in the last case, and removed a stone the size of a pigeon's egg. (See fig. 6, Plate II.)

CASE XCI.

Stone in the Female Bladder.—Dilatation, with partial Section of Urethra.—Recovery.

A young lady, aged about twenty years, laboured under the rational symptoms of stone in the bladder, for twelve or eighteen months. The symptoms were preceded by lumbar pain, but came on rather suddenly. They had latterly interfered with her ordinary amusements, such as hunting and carriage exercise, and even walking was distressing unless at a very measured gait. There was great pain in the region of the bladder, and much urgency in emptying it. The stream was often suddenly stopped, followed by great agony. The only position in which she could relieve herself from her sufferings was by leaning over a table on the abdomen. She was sent to me from the country. Her general health was good. Her urine was acid in reaction; sp. gr. 1020; colour, fawn; the deposit constituted an opaque tremulous mass about an inch in depth, with a whitish stratum on its upper surface, the supernatant fluid being perfectly clear. The deposit was miscible when subsequently shaken, and showed under the microscope lithate of ammonia granules, lithic acid, oxalate of lime, and pus and blood cells. On sounding her, I detected a foreign body. A few days afterwards

I dilated the urethra with a sponge tent, and then incised the canal by means of Crampton's cutting dilator. An oxalate of lime calculus was quickly seized and removed, and is represented in fig. 21, Plate XIV. The lady has since remained perfectly well.

Amongst the questions which naturally suggest themselves on taking a review of the foregoing cases, the most important, perhaps, are—the application of the study of the pathology of the urine, as an auxiliary in ascertaining the nature of vesical calculi and their complication, or otherwise, with renal disease—the selection of the operation of lithotomy, as suitable to the removal of the calculi under review—and the effects of chloroform in augmenting the difficulties attendant on the operation.

As regards the study of the pathology of the urine, it will be admitted that in cases of vesical calculi it is almost indispensable to successful treatment, and that it must often determine the propriety and the selection of operation. The presence of the crystalline deposits noted, and the continuous absence of any phosphatic appearances, almost instinctively led to the conclusion arrived at respecting the nature of the calculi in cases LXXXI. and LXXXII., a circumstance somewhat unusual in the former, from the man's prolonged disease, but by no means so in that of the child. So far, the pathology of the urine taught the nature of the calculi; but in the case of the man, the important question to solve was, the existence or otherwise of renal disease; and here it appeared to me to be a most valuable auxiliary.

The amount of pus in the urine was very considerable. The duration of his disease was lengthened, his constitutional disturbance great, yet there was never any appreciable change in the density of the urine, neither was there any addition to the amount of albumen in the supernatant fluid: it was not affected by the quantity of pus present. To those features I attach much value. In established renal disease, of the class now under consideration, the density of the urine is low, the amount of albumen considerable. In Case LXXXI., the density was not below average density, when we recollect the man's insatiable thirst, and hence view his urine as "*urina potus*."

The amount of pus in Case LXXXII. was very trifling, and so with blood; and in the supernatant fluid there was not a trace of albumen. The suspicion of renal disease was not entertained; but the principle is supported, to which I attach some value, namely, that pus in the urine, no matter in what amount, is to be traced to other sources than the kidney, or, in other words, that it is added to the urine *in transitu*, after it has passed from the kidney; if the amount of albumen in the supernatant fluid does not bear a proportion to the pus in the deposit. The density of the urine was high in Case LXXXII., but the boy was free from urinary fever; if he had a paroxysm of it, it was evanescent; it was a paroxysm of vexation from pain, in consequence of obstruction to the free egress of urine from the bladder. He was *now* in agony—almost in fever; relieve the bladder, and he was the next moment cheerful, and playing about. Not so with Case LXXXI., in which the patient went through

all the stages of urinary fever. His urine was loaded with pus.

Few remarks are necessary respecting the selection of operation. That of lithotrity was wholly out of the question; the obstacles to its performance were insurmountable. The patient was very irritable; the urethra was peculiarly morbid, the bladder was intolerably sensitive, and the most delicate local interference produced an accession of fever. The size of the calculus was not objectionable for such an operation, but its density was; and the reduction would have been attended, if attempted in a case like his, with serious immediate and later consequences. As to the child, I was anxious to measure his calculus, although not with a view to lithotrity, which, at his early age, is not a very feasible operation, even admitting that his calculus was of so friable a nature, as to guide me in the mode of securing the stone. I considered it was small. I apprehended that the retaining of the urine previously to operation could not be easily accomplished, from the extreme irritability of the bladder, and that from both these circumstances difficulties would arise in the course of our attempt to relieve him.

Calculi have been removed by lithotomy from the child, of a size so small that if it had been previously ascertained, dilatation of the urethra would have permitted their escape; again, calculi of that description have not been found in the bladder after operation. Probably they eluded protracted and painful searching by escaping, on the first introduction of the gorget or

forceps, with the sudden gush of urine at that time. At no period of life is this casualty so likely to occur as in the child, from the almost complete correspondence of the axis of the bladder with that of the wound made for its removal. I have seen the operation of lithotomy in the child, where no stone was found on reaching the bladder.

Sir Philip Crampton has operated when a similar casualty happened, and when I, by chance, subsequently discovered the calculus in a clot of blood on his dress.

Chelius has met with a similar case, where, by equal chance, a small calculus was found in the jaws of the forceps which had been used, whilst they were being cleaned.

I have often watched the exhibition of chloroform in lithotomy, and have administered it; and, in a monograph which appeared under the head of the Proceedings of the Surgical Society of Ireland, in the volume of the *Medical Press* for 1851, and afterwards as a distinct publication, entitled "Chloroform in Surgery," I directed attention to the remarkable effects of this agent in inducing symptoms for the presence of which the lithotomist should be prepared. The symptoms alluded to are specified in the report of the cases given. I have observed identical conditions in Edinburgh and in London, where I had the opportunity of seeing the operation of lithotomy performed by Professor Syme and Professor Ferguson. On each occasion the full anæsthetic effects of chloroform were produced, and in each case the symptoms I allude to were manifest.

In the case of Professor Ferguson, the chloroform was administered by Dr. Snow, and the effects of the agent were so complete that the child was not tied for the operation. Notwithstanding, the rectum was protruded, and violent straining efforts were made, whereby a portion of the contents of it and of the bladder escaped. In other hands than those of Professor Ferguson, considerable annoyance might have arisen. The safe penetration of the urethra, in ordinary circumstances, is a matter of so much difficulty, and so frequently perplexing to the most experienced operator, that it is right the surgeon should be acquainted with the additional impediments occasionally caused by the administration of this anæsthetic.

The difficulties in every step of the operation are serious. Even in the first incision the rectum is in danger, unless it so happens that there is prolapsus. In the second, the rectum laps over the groove of the staff, and unless the surgeon watches his opportunity, in the interval of the violent straining, the knife must penetrate it: again, should he use the lithotome, he is perplexed at not finding the opening in the urethra for its admission. In either instance he may transfix or injure the bladder, and in the last stage of the operation the bladder may be everted. The ordinary effects I allude to are the most violent forcing and straining efforts, as if the whole contents of the pelvis were about to be protruded, efforts which often continue throughout the different stages of the operation. In other cases,

there is added a sort of automatic muscular movement, whereby the pelvis is rolled about so that it is almost impossible to fix it. In Case LXXXII., it was very difficult to steady the pelvis, and I need not add, how very materially this must interfere with the objects of the surgeon. I know not how to account for these anomalies. The subjects of vesical calculus in childhood are, generally speaking, in rude health, at least those who are fit subjects for operation. Those in adult life are dissipated either from ordinary habits, or from habits incidental to their sufferings. In either class of case, chloroform does not act in the most favourable or placid manner. The remedy for those anomalous effects of chloroform is, in the opinion of some, to press this agent, and to overcome them. This expedient is, however, not successful in many instances.

The following extract from the monograph I have alluded to may not here be inapposite:—

“I have occasionally found that the seat of disease or injury is, when under anæsthetic influence, as if cognizant of what is contemplated, or, in other words, that its organic sensibility is not destroyed; and it is, hence, absolutely indispensable in some operations that the surgeon should be prepared for this, to avoid any rash movement on his part or on that of his patient. Thus, I have seen the rectum protruded, in cases of disease engaging it, when the patient was perfectly unconscious, and all tactile sensation blunted. In a similar state of the system, I have seen the upper and lower extremity, the seat of the operation, thrown

into automatic movements, whilst the remaining portions of the muscular system were tranquil and motionless; and in sounding the bladder, and in the various stages of the operation of lithotomy, I have seen a regular paroxysm of what is termed a fit of the stone, when the patient was perfectly anæsthetic, as far as the conclusive signs of such state are concerned."

The operation of sounding for stone is a proceeding which is often difficult, and may mislead us in our conclusions. The position of the patient should usually be recumbent, the pelvis being well raised; but I have had cases in which it was impossible to strike the stone in any but the erect posture.

In some instances where the bladder is pouched, I believe that mistakes are made by not causing the patient's buttocks to be sufficiently elevated. I have seen the diagnosis at once confirmed by this manœuvre, the calculus having been rolled out of its hidden position by the change of posture. We must also consider the age of the patient, and the probable condition of his bladder, and so be prepared for sounds and sensations, which may be due to such causes as hypertrophied walls with phosphatic deposits upon their rugous lining membrane, or an encrusted tumour, or a rapidly contracting bladder or pouch. These do not give the sudden limited sharp click of a stone, but a sort of dull, fluttering, continuous and extensively-felt sensation.

It is to be remembered that some calculi are of much less density than others, and that they are very

easily set in motion when the bladder contains urine. Thus, even the action of the sound may be sufficient to cause such a movement in the fluid as will displace the stone and make it pass in various directions, so evading detection.

Thompson's sound is a very favourite instrument for most cases, but if special care be not taken, it may cause mischief to an enlarged middle lobe, or a sinuous prostatic urethra. Where this gland is hypertrophied, and the change is of long standing, there is frequently a deep pouch behind it in which a stone may lie undetected. If the finger or fingers be introduced into the rectum, we shall often be able to dislodge the calculus and elevate it into contact with the beak of the sound.

Surgeons are sometimes disappointed when they learn that a case, in which they have made careful but unsuccessful examinations, has at once satisfied the suspicions of another surgeon at a distance, whom the patient has consulted. This has happened to myself. I have failed to detect a stone afterwards struck in London; and I have found stones which London surgeons have failed in discovering. There should be no reflection upon the skill of the surgeon in such cases. The explanation is, that the stone has been encysted or temporarily fixed in a portion of the bladder, and has not obeyed the movements of the body by the surgeon. But a long railway or car or sea journey is often attended by a sudden loosening of the calculus, and it is then detected by the person who may next be consulted on the occurrence of painful symptoms. This suggests the expedient in doubtful

cases of applying the test of rough exercise before finally deciding.

It should also be borne in mind that the presence of morbid deposits in the urine in the bladder may give rise to much error. Repeated soundings are sometimes attended by no satisfactory result. This appears to be accounted for by the amount of viscid mucus that may be present. The stone becomes so coated that the usual click is quite muffled. Indeed, I have known the same deception to occur in lithotomy where there was much hæmorrhage into the bladder; the surgeon not being conscious that he held the stone in the forceps because of its covering of coagulum.

In selecting a staff for the operation of lithotomy attention should be paid to its size. This should be adapted to the urethra, so as to fill it without being tight. In the latter event, there is the danger of pushing the lax mucous membrane before the instrument, and so of opening the urethra more anteriorly than is desirable, or of cutting it irregularly.

The introduction of the staff should be very carefully effected. There is here the special danger of passing it through the membranous portion of the urethra between the bladder and the rectum. This is especially the case in children. The surgeon will become aware of his misfortune by the fixity of the instrument on attempting to move it about. There is no cavity to partially rotate it in, and if it be pushed on, the tip of the staff will strike against the prominence of the sacrum. To prevent this accident, and indeed to ascertain it, the forefinger of the left hand should be

passed into the rectum, just within the anus, and the point of the instrument be guided in the proper channel. Should the accident happen, there is no alternative but to withdraw the instrument a little and to endeavour to pass it in the right direction, or to remove it altogether, and then to re-introduce it. I have seen this done successfully more than once, and have myself adopted the proceeding for others.

The surgeon should always feel the stone himself before commencing his operation. It will often occur that the assistant who may have introduced the staff will detect the calculus, while the operator cannot. This may arise from the shape of the instrument, or from the position of the stone. If the staff be withdrawn until it reaches the neck of the bladder the calculus will at once be found. I think that if the holder of the staff can be depended upon, it is as well that the operating surgeon should complete his work without attempting to guide that instrument. He has the finger of the left hand free to direct his knife in the next important stage of the operation; but the staff should be held firmly, and should be well hugged up under the arch of the pubes, so as to be steady during the completion of the deep incision. I would not even consider it requisite to lateralise the staff. The surgeon will accomplish that sufficiently himself. He keeps his nail well in the groove, and he can measure the angle to which he may carry the knife. Moreover, he feels the apex of the prostate, and so can properly estimate the extent of his incision.

It often happens that the last stage of this operation is the most troublesome. The most expert surgeon will occasionally be foiled in his efforts to remove the stone. He often cannot calculate on its size, or its shape, or its situation.

Many expedients suggest themselves as regards the successful grip of the stone by the forceps. Thus, the very direction in which the gorget, if used, is fixed to receive the forceps may tend to almost roll it into the jaws of the latter. Some are advocates of a movement which I have adopted with success, as far as catching the calculus is concerned, but with some annoyance as to the portion of the forceps within which it is grasped. I allude to making an inclined plane of it on its reaching the bladder, by pressing the portion of it at the external wound firmly against its inferior angle and separating the blades, by which means the calculus falls within them. In the hands of an expert surgeon this might succeed very well. Another expedient is to separate the blades in the bladder widely, so that the folds into which this is thrown are as if opened in every direction, and then by gentle approximation the stone is caught. This is done in the transverse direction. I prefer to have one blade pressed against the *bas fond*, and the upper raised, when the calculus is disengaged from the folds of the bladder and usually at once grasped.

If a canula is used, care must be taken to adapt its length to the age of the patient and the depth of the wound. I have seen excellent surgeons from whom more caution might have been expected, use a canula

suited to an adult in the case of a child four or five years old. The agony suffered and the mischief done may well be imagined. Under any circumstances should the tube give pain, the string must be cut, and it should be allowed to fall out. For the chemise I prefer old linen to calico; and in introducing the instrument it should be well oiled, and be passed into the bladder along the finger.

Is the surgeon justified under any circumstances in delaying operation, even when he is certain of the presence of stone in children, or at all events in those under adult age? I should say he is.

In the great majority of cases where calculi have escaped by the urethra, or have been removed from it, the individuals were *young*. This, at all events, appears from the different reports on the subject here and elsewhere; and it is a circumstance sufficiently frequent to deserve much consideration. The removal of a stone from any portion of the urethra is less hazardous than the operation of lithotomy; in fact, it may be said that there is no risk in it. In cases, then, where there is not much suffering, when there is reason to suppose that the stone is *small*, the surgeon is, I believe, justified in delaying the operation, in the hope that spontaneous expulsion from the bladder may take place, even into if not out of the urethra. But on the other hand, in cases in which the stone is such that it cannot possibly escape, operation should not be long delayed; the constant irritation may produce disastrous results, and in some instances be the forerunner of malignant disease.

Hæmorrhage may occur at different periods, but most usually takes place, if at all, within eight days. The surgeon must satisfy himself as to the site of it. To do this, the clots must be cleared out of the wound, and a *canule en chemise*, armed as already described, with a sponge saturated in tincture of matico, introduced in such a way as to exercise sufficient pressure on the parts. Sometimes bleeding into the bladder occurs to a large extent. It may be first detected by the blanched aspect of the patient, the depression, straining, and the general symptoms which attend hæmorrhage. The distended bladder will indicate the locality of the mischief. The rectum should always be cleared before operation, and afterwards in the curative stages equal care is necessary, as illustrated in Case LXXX. The tenesmus, referred to the bladder, may be wholly caused by the loaded state of the rectum, and may produce violent hæmorrhage from the wound.

It is a rule which ought never to be departed from, that the surgeon should make himself acquainted with the probable nature of the stone, and its dimensions, by a careful study of the urine, and the use of some method of measurement. He is able to make preparations accordingly, and to avoid the loss of time and the prolongation of the operation which I have seen follow neglect of these precautions. This should be done some days before the final proceeding, so that there may be time for any irritation caused by the examination to subside. The measurement of a stone is particularly useful in children, as it enables us to

determine whether we shall interfere by the more severe methods, and by which of them. I have had an instrument made on the principle of Mr. L'Estrange's gauge-sound, which may be termed a lithometer and sound for the child. Its length is thirteen inches; its size between five and six on the ordinary catheter scale; and its curve that which I have found to answer so well for use in childhood.

On referring to the annexed woodcuts, the several provisions contemplated in the instrument will be manifest. The front view of the handle portion exhibits a scale, the lines on which mark the distance of separation of the blades, while the side view of the same shows a milled-headed screw whereby the grasped calculus is secured and fixed until accurately measured. By joining the two separate halves of the instrument in the drawings, its exact length and curve are ascertained. At the extreme end of the handle portion is also a provision for the sounding-board or tun-dish, if required.

This lithometer or sound appears to me to be well suited to its objects. It traverses the urethra with ease, and it ascertains the presence and size of the calculus, if in the bladder. The application of the instrument to the purposes of lithotripsy would, in my opinion, be more than hazardous, as the very dense nature of the calculous concretion in the majority of instances, at this early period of life, demands an apparatus of much more solid construction. However, the practical benefits derivable even from its limited applicability to the measurement of calculi in children

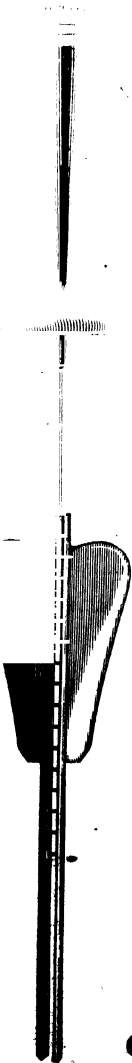


Fig. 25. Shaft of Lithometer.

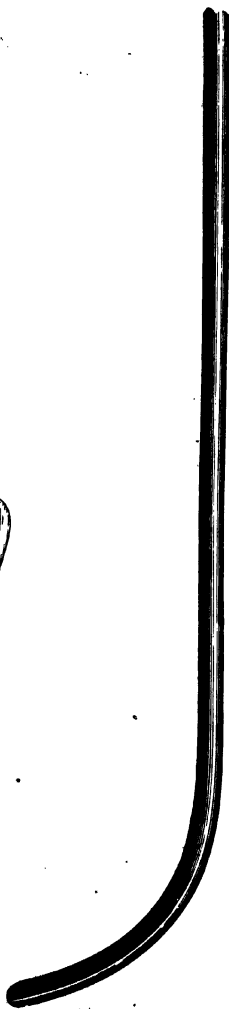


Fig. 26. Lithometer used as a Sound.



Fig. 27. Side View of Lithometer.

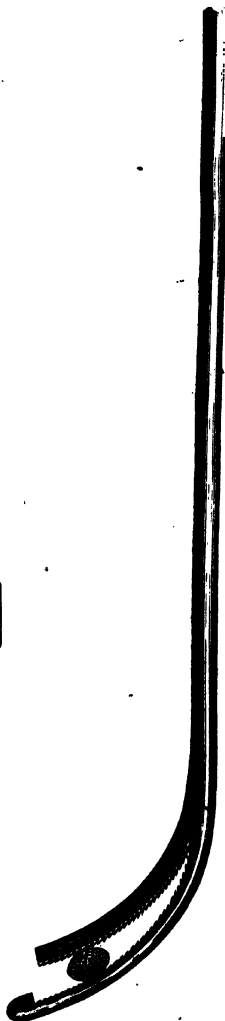


Fig. 28. Lithometer in use.

are unmistakable. Moreover, it is quite obvious that in a case where the calculus was ascertained to be very small, it might, when grasped, be withdrawn by this instrument to a greater or less distance in the urethra, when a comparatively simple operation would effect its extraction. Apart from such procedure, the urethra, even in the child, might be dilated to a calibre which would admit the partial escape of such a calculus when found to be present, and, perhaps, insure its final exit. Very large calculi, indeed, are frequently discharged from the bladder, along the tract of the urethra, without any surgical assistance.

The symptoms of stone in the bladder in the child are, very often, extremely equivocal, and require much circumspection. All the most marked symptoms may exist, and yet no stone be found, and stone may be detected even in the absence of these, accident leading to the examination of the bladder.

The same peculiarity will be found to exist in the adult; but here assistance is obtained from details which are not available in the case of a child, who is too often a perfectly passive agent in the history of his ailment.

In such cases it will be found that diagnosis will be materially assisted by attention to the character of the urine—to the conformation of the genital organs, and to a minute analysis of the more prominent features of the history. In illustration of this, I may instance a few cases.

A child, aged six years, the only son of a man who was himself the subject of irregular, arthritic

attacks, had on many occasions been observed by his attendant to wince when passing water—to slip it in bed at times, and to strain while the last drops were escaping. The penis became full and turgid after micturition, and the urine appeared heavy, and had a strong aromatic odour. I found that such attacks were always accompanied by more or less dyspepsia, and were produced by causes too frequent amongst the children of the upper classes of society. The urine was of low specific gravity, and loaded with bath-brick deposit, scattered throughout which were crystals of lithic acid, and lithate of ammonia, the urine at the same time being highly acid. I carefully examined the child, but could discover no stone, and all his symptoms disappeared under the ordinary treatment for urine of excessive acidity.

In the child, at all ages, it is by no means uncommon to find this condition of urine. In the humble as well as the better classes of society, what we may term lithuria is not unfrequent. In numerous instances, in hospital and private practice, I have found this to be the case, and it demands the attention of the practitioner. How often are we told by the parents of such children that the urine is white and muddy immediately after being passed, and especially if the weather is cold. Indeed, many will state that it is absolutely so at the time of passing; but I have been unable to detect this in such conditions of the urine. Repeatedly, however, I have had it passed in my presence—have tested it directly in a glass, and examined its chemical and physical characters. In the

greater number of such cases it becomes opalescent within a very few minutes; and long before the temperature of the fluid acquires that of the surrounding medium, a copious bath-brick deposit falls to the bottom of the vessel, of variable depth, always opaque, and with the supernatant fluid apparently muddy, but in reality perfectly transparent, as can be easily ascertained by decanting some. The opalescence will then be found to be attributable to the coating of the inside of the glass with a thin stratum of the lithate of ammonia, which constitutes the principal ingredient in the deposit, as already noticed. The reaction is always acid, and the density more frequently under than above the average density in the adult. It is particularly important to attend to this, as the extremes of density repeatedly occur, and in that so low as 1005-6, a quantity of lithic acid will often be detected under the field of the microscope, which would never be suspected.



Fig. 29.—Polypus of the Rectum.

The presence of stone may be simulated in children by the symptoms produced by polypus in the rectum.

In a case which came under my care there was great irritability of the bladder, and I deemed it necessary to introduce a sound. During this operation a prolapse of the rectum took place, and a polypus, such as represented in Fig. 29, was discovered. The symptoms subsided on the removal of the growth. Fig. 30

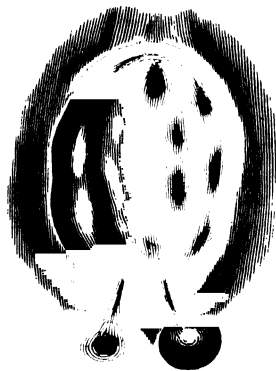


Fig. 30.—Polypi of the Rectum.

delineates two of the tumours in the rectum of a boy; but here there was no vesical irritability.

I am not aware of more than one case in this city in which the operation of lithotomy was had recourse to a second time for a recurrence of vesical calculus. In this case no second stone could be detected, on the most careful examination, after the first operation, and all the symptoms had subsequently disappeared; and yet within two years an almond-shaped calculus was removed by the same surgeon at a second operation, the ordinary rational signs of stone having suddenly occurred. Its composition was the same as

the first. The shape of the stone is by no means an unerring indication to the operator of the presence or absence of another, as there may be no appearance of facetting upon either, even should two exist.

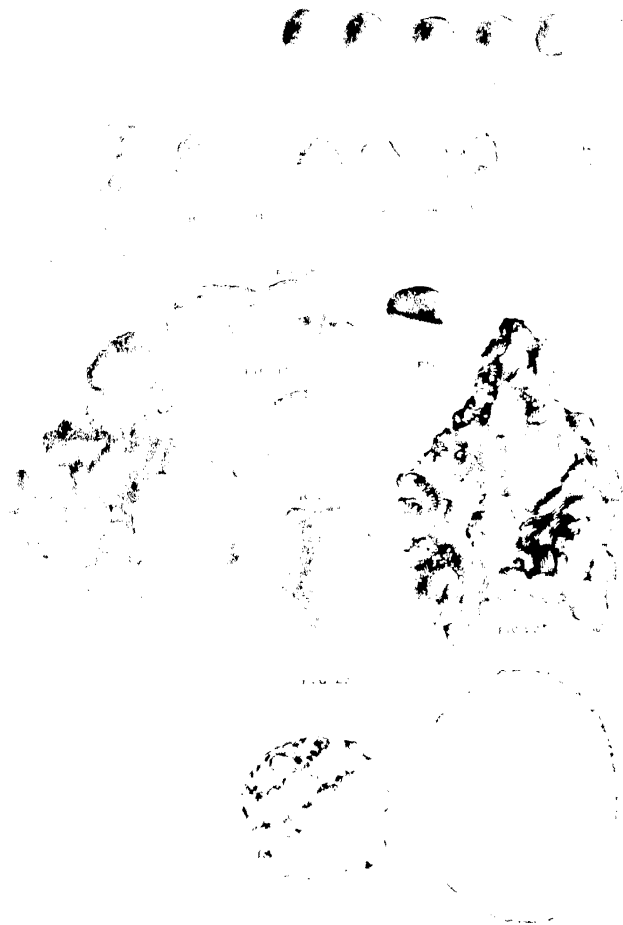
CASE XCII.

Equivocal Symptoms of Stone in the Bladder.—Probable Escape of a Xanthic Oxide Calculus through the Urethra.—Recovery.

A gentleman of middle age, of full, athletic frame, suffered for some time from irritability of the bladder, amounting on one or two occasions almost to retention, and accompanied by uneasiness in the perinæum. At times there was interruption in the current of urine, and the perinæal discomfort was so great that he could not sit erect on a chair, but was obliged to place himself on its edge. One day, on standing up from this posture, he heard some solid material drop on the floor, and on searching for it he found lying near his chair a small brownish-coloured substance, about the shape and size of a large garden pea. (Fig. 18, Plate XIV.) It was solid and rough, and from its resemblance to a urinary calculus which he had previously seen, the gentleman gave it to me, and asked if it could have escaped from his urethra into his dress without his knowledge, observing that there was no material near him which could account for its presence. At the time, he had no additional urinary distress, but subsequently he was free from his former sensations, and has had no return of them since.

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MR. FLEMING

ON THE REMOVAL OF URINARY CALCULI FROM THE BLADDER
AND FROM THE URETHRA.

1854

EXPLANATION OF PLATE XIV.

Figs 1 to 7. Calculi passed by a gentleman between sixty and seventy years of age, at one time. The urine was purposely retained in the bladder until there was considerable distention. A catheter, with a stop-cock attached, which had been introduced, was suddenly withdrawn, and the calculi were immediately expelled by the rapid current of urine. The stop-cock enabled the patient to relieve himself of any pain by permitting a small quantity of urine to escape from time to time during the preparatory process. Figs. 1 and 2 are sections.

Figs. 8 to 17. Calculi passed or removed from the urethræ of different patients. Fig. 8 represents one of peculiar date-stone shape, which was impacted in the fossa navicularis of a child, and was removed by section of the upper part of the orifice of the urethra.

Fig. 18. Xanthic oxide calculus (Case XCII.)

Fig. 19. Calculus impacted in the urethra. (Case XLI., page 145).

Fig. 20. Facetted calculus removed from the prostatic portion of the urethra, by lithotomy.

Fig. 21. Calculus removed from the female bladder (Case XCI.)

Figs. 22 and 22*. Represent inner and outer aspects of a portion of fibro-calcareous tumour of the uterus. (Case XCIII.)

Fig. 23. Calculus referred to in note, page 142.

Figs. 24 and 24*. Calculus and section of it, removed from a boy by lithotomy.

Fig. 25. Mulberry calculus removed by lithotomy. (Case LXXXVII.)

This body, on subsequent examination, proved to be a xanthic oxide calculus. The occurrence of this variety is extremely rare. It was originally described by Marcet, who coupled it with the "fibrinous" in applying to them the term "nondescript." It is a curious coincidence that the subject of the "fibrinous" calculus, who was a patient of Sir Astley Cooper's, found the substance in his bed, having passed it without being conscious of doing so. Dr. Arthur Hill Hassall made a careful examination of the calculus, and his letter is subjoined:—

" 74, WIMPOLE-STREET, CAVENDISH SQUARE,
" *October 17th*, 1864.

" DEAR SIR,—The calculus concretion reached me safely, and I at once submitted it to analysis.

" I observed, first, that the mass externally was yellow and pulverulent; internally compact, shining, and of a somewhat blood-red colour, and that it was very brittle.

" I found : 1st, that it was only very slightly soluble in boiling water, or in cold alcohol, but was slowly dissolved by hot alcohol and spirits of wine of specific gravity 0·835.

" 2nd. That it was but little acted upon by dilute hydrochloric acid, and dissolved only in minute quantity after prolonged digestion in hot strong hydrochloric acid, the portion thus dissolved (hydrochlorate of xanthine) becoming deposited as the solution cooled in the form of, as seen under the microscope, rounded and oval globules.

" 3rd. That it dissolved with slight effervescence in strong nitric acid, the solution leaving on evaporation a yellow residue. This was partly soluble in water; and the aqueous solution, when evaporated to dryness, was deepened in colour, and became of a brown tint when treated with a strong solution of caustic potash. The nitric acid solution, on the addition of nitrate of silver, threw down a precipitate which, on boiling, was dissolved, but again became precipitated as the solution cooled, the flocculi exhibiting, under the microscope, a somewhat globular constitution.

" 4th. That it was somewhat freely dissolved in the cold by sulphuric

acid, from which solution it was not precipitated on dilution with water; in which respect it differs from uric acid.

"5th. That its solution in liquor potassæ was of a pinkish colour, and that it was not the least disturbed by hydrochlorate of ammonia, showing the absence of uric acid; further, the potash solution furnished a residue of a pink or carmine tint.

"6th. That it was almost insoluble in a solution of carbonate of potash, in which it increased greatly in bulk, the solution becoming after a time of a pinkish colour, a further proof that it was not composed of uric acid.

"The above reactions are sufficient to show that the substance in question consists of either xanthine or the closely allied hypoxanthine, and prove that the suspicion entertained by you as to its nature was correct.

"The only particulars in which the results of my examination differed from the statements recorded respecting the behaviour of xanthine with reagents were, in its solubility in hot alcohol, and in the aqueous solution of the nitric acid residue, furnishing on evaporation a brownish yellow in place of a blood-red or carmine residue, as usually described.

"It is to be observed, however, that its solution in caustic potash did yield, on evaporation to dryness, a product of a pink or carmine colour.

"The reactions of xanthine and hypoxanthine, as laid down in books, do not appear to be sufficient to enable the chemist, in the absence of an elementary analysis, to distinguish these two substances. The quantity of the calculus now remaining is too small to allow of an ultimate analysis being made. Its solubility in alcohol, its effervescence with nitric acid, the residue left on evaporation of the nitric acid solution becoming, when treated with caustic potash, of an orange brown colour, and the extreme brittleness of the concretion, seem to point to hypoxanthine.

"I presume that you will make known to the Profession the particulars of this very interesting case.

"I remain, dear Sir,

"Yours faithfully,

"ARTHUR H. HASSALL.

"C. FLEMING, Esq., M.D."

Dr. Grimshaw's analysis corresponds with that of Dr. Hassall.

CASE XCIII.

Supposed Stone in the Bladder of a Female.—Operations of Lithotomy and Lithotripsy. — Removal of large Masses of Peculiar Calcareous Concretions. — Fibro-calcareous Tumour of the Uterus.—Fatal Result.

A woman, aged forty-five years, applied at hospital complaining of extreme urinary distress, at the same time presenting a remarkable flattened and irregular fragment of what appeared to be exfoliated bone. This she stated she had passed through the urethra on the previous day, after intense suffering. She said that for some days she had much scalding at the orifice of the urethra, and on applying her finger she felt a hard gritty substance there. She was unable to remove it; but after a violent paroxysmal effort to micturate, it was shot out. It was in colour like the large fragment exhibited in fig. 22, Plate XIV. The substance was so different from any urinary concretion I had ever seen, that I did not attach any credit to her statement. She was married, and had six children, her confinements being easy and expeditious. Immediately subsequent to the cessation of the menses, twelve months before, the bladder became irritable. This symptom increased rapidly in severity; and then incontinence of urine set in, and ultimately all the rational signs of stone were established. She had frequent urgent desire to micturate, and severe pain at the end of the act. These attacks, she stated, recurred in most violent paroxysms, which exceeded in intensity the most painful sufferings she ever experienced

during childbirth. During the previous three years she had only menstruated twice, and on each occasion the catamenia were scanty and yellow. She experienced much distress from a pain in her back, and from incontinence of urine.

On proceeding to examine her, the first circumstance that arrested my attention was that the poor creature could not lie supine in bed, from the aggravation of her sufferings which it caused. The pudenda and thighs were found to be excoriated, and as if dusted with phosphatic deposits, and the urine escaped incessantly. On examination, the vagina and rectum were found free from disease. The uterus was carefully examined, and was considered to be healthy. The recti muscles were hard and board-like, so that no examination of the bladder could be made through the abdominal walls. She declined to take chloroform then, and it was only at the operation, some days subsequently, that I was able to make this exploration. I proceeded to examine the bladder with an ordinary metallic catheter, and immediately struck some solid substance, which I assumed to be an ordinary stone. It occurred to me, however, as a remarkable point in connexion with the case, that the physical signs of stone were much more easy of detection during the paroxysms of pain than in the intervals, and that it was not necessary in the former to introduce the instrument so far in order to strike the solid substance. The urine had a very ammoniacal odour, was loaded with mucus and phosphates, and had alkaline reaction.

Her condition was loathsome to herself and those about her, and she was crying out for immediate relief from her sufferings. Under these circumstances, with the concurrence of my colleagues, I proceeded to remove the stone, trying first dilatation of the urethra. Failing to remove the foreign body with a forceps, I introduced a lithotrite, and broke some portions of it, and then removed about two ounces of calcareous fragments; but finding an enormous quantity still remaining in the bladder, it was deemed best to have recourse to the supra-pubic operation, and I removed thereby some large masses. The quantity remaining being still very great and adherent, I desisted from further interference, and sent the poor woman to bed. She had great relief from the operation, but she sank from exhaustion in four days. On post-mortem examination the kidneys and other abdominal viscera were found healthy. The uterus was firmly adherent to the bladder, and on opening the latter an enormous quantity of calcareous matter was found in it. Plate XV. represents most truthfully the appearance of the parts. The concretion occupied a large portion of the posterior aspect of the bladder, and another mass of the same substance lay upon the left side, so intimately united to the lining membrane that its outer surface fitted accurately into the several compartments or irregularities presented by the inside of the bladder. The calcareous mass was imbedded in a large soft tumour, having an attachment to the anterior wall of the uterus.

EXPLANATION OF PLATE XV.

The bladder is cut open, and the walls are reflected. The portion of the tumour stripped of calcareous matter, corresponding to the opening in the bladder, was reached by the forceps during the operation.

- A. Catheter passed through the urethra.
- B. Orifices of ureters.
- C. Detached portions of the concretion.
- D. Soft lobulated portions of the tumour, surrounded by calcareous masses

EXPLANATION OF PLATE XV.—(*continued*).

The figure represents a median vertical section of the fibro-calcareous tumour of the uterus.

- A. The urethra.
- B. Cavity of the contracted and thickened bladder.
- C. Ulcerated opening in wall of the bladder, allowing portions of the calcareous deposit to pass into the cavity.
- DDD. The uterine tumour.
- EE. Anterior wall of the uterus.
- FF. Posterior wall of the uterus.
- G. Calcareous fragment occupying the seat of ulceration into the bladder.

The case which has just been noted is extraordinary, and I believe unique. I have had the advantage of having the parts examined by Doctor (now Professor) Bennett, Dr. Arthur H. Hassall, of London, and Dr. Grimshaw. Their opinions will speak for themselves. Dr. Bennett says:—

“I think that the specimen which you left for examination with me is an instance of a fibro-calcareous tumour growing from the anterior wall of the uterus. It has opened the bladder by its pressure, and seems to have protruded into it through an ulcerated opening. That it originally grew from the uterus is evident from the course of its fibres, as seen in the vertical section I have made through it. It is quite easy to dissolve the earthy matter out of the fibrous basis of the tumour, and the composition of the earth is that of bone earth. The microscope shows that the structure of the calcified parts of the tumour is the same as that usually found in such uterine tumours, grains of earthy matter laid down, without the true arrangement of bone, in fibrous tissue.”

Dr. Hassall gives the following analysis of the two portions:—

	<i>“ Compact portion.</i>	<i>Spongy portion.</i>
	Per cent.	Per cent.
“ Water,	5·1	3·0
Animal matter, emitting the odour of } burnt bone, }	20·6	14·6
Carbonate of lime,	2·5	6·2
Phosphate of lime, with a little phosphate } of magnesia, }	71·0	75·7
Loss, and undetermined matters, . . .	0·8	0·5
	<hr/> 100·0	<hr/> 100·0

“These results lead to the inference that the substance consisted of bone altered by prolonged contact with the urine, an inference strengthened by its physical characters; the outer or compact portion apparently representing the external or hard, and the internal the soft or spongy part. On examining what I will call the external surface, impressions were visible, probably indicating the grooves through which the nourishing vessels of the bone entered.

"I have now to mention two particulars which convert the above inference into a certainty; dilute hydrochloric acid applied to a piece of the compact tissue dissolved out all the calcareous matter, and left a distinct matrix of gelatine, such as a piece of recent bone would furnish; lastly, sections examined under the microscope presented numbers of what it is difficult not to believe were altered bone-cells."

Dr. Grimshaw writes as follows:—

"13, MOLESWORTH-STREET,

"December 10th, 1864.

"DEAR DOCTOR,—I have again examined the curious concretion which you gave me, with a view of ascertaining whether or not it be bone.

"The portion you gave me was of a curved form. The inner concave surface was soft and crumbly; the outer of very great hardness.

"The inner surface not presenting any bony appearance, I confined my experiments chiefly to the outer, and found it to be of the following composition—a hundred parts containing, of

" Water,	7.40
Organic (animal) matter,	9.34
Carbonate of lime,	8.03
Phosphate of lime,	59.84
Oxalate of lime,	11.91
Alkaline and magnesian salts,	3.63
	<hr/>
	100.15
Excess,	0.15
	<hr/>
	100.00

"NOTE.—The slight excess is due to the ash of two filters which was not subtracted at the proper time.

"I have not had time to make a *minute* examination of the soft portion, but find it contains less oxalate of lime, more phosphate of lime, and more organic matter. I think that a substance containing so much oxalate of lime, and so small a proportion of organic matter, can scarcely be considered bone, although it may once have been so. It is curious to remark that the amount of phosphate of lime corresponds *exactly* with that of bone; and if we suppose the substances once to have been bone, we find that the portion of animal matter now wanting has been replaced by oxalate of lime.

"I may also mention that the concretion differs much in its composition in its different parts; so that it is improbable that any two analyses would exactly agree.

"Yours truly,

"THOMAS GRIMSHAW, M.D.

"C. FLEMING, Esq., *Merrion-square.*"

I am indebted to my friend Dr. Purser for calling my attention to the fact that Virchow in alluding to anterior fibrous tumours of the uterus as sometimes encroaching on the bladder, and producing what he terms bladder difficulties, which are the principal causes of complaint, says:—"The urinary bladder, which, as is known, lies with its hinder wall in contact with the *collum uteri*, is usually in such cases drawn upwards with the uterus. The consequences of this are urinary troubles of the most difficult character, which are often the first and principal complaint of the patient. Perfect distention of the bladder with urine is no longer possible: hence the patient cannot retain her water, and is troubled with frequent micturition. Again, complete evacuation of the bladder is impossible: the retention thus produced gives rise to vesical catarrh, which may attain a great degree of severity. In one such case, where an almost completely calcified myoma was seated on the fundus of a greatly elongated uterus, which besides was attached by perimetritic adhesions to the large intestine and neighbouring parts, the vesical mucous membrane was densified (*verdickt*), swollen, hyperæmic."

CASE XCIV.

Symptoms of Stone in the Bladder.—Lithotomy.—Calculi in the Kidney.—Death.

An effeminate, chlorotic youth, aged eighteen, was sent to hospital from the country, having symptoms of stone in the bladder. On seeing him the next morning,

I found him suffering from incontinence of urine, owing to enormous distention of the bladder, which was traceable up to the umbilicus. He stated that some months before his admission to hospital he was first suddenly attacked with retention of urine; he suffered most agonizing pain, and was obliged to apply for relief to a surgeon in his neighbourhood, who stated that on passing the catheter he distinctly felt the click of a stone. The first instrument I introduced was a gum-elastic catheter, and there was a sensation distinctly communicated of the presence of some foreign material in the bladder. On sounding him in the ordinary way, I detected the sharp click or ring of a stone, and felt a resistance as of a calculus encysted in the walls of the bladder. The density of the urine varied but little, ranging between 1020 and 1025. When it was passed voluntarily the urine was acid, and when it was drawn off by a catheter it was either very feebly so, or alkaline. It was always muddy, and of a whitish yellow colour, and threw down a copious flocculent deposit, leaving the supernatant fluid tolerably clear. The deposit was miscible with the urine when shaken, especially when the fluid was acid. When the reaction was alkaline the deposit was muco-purulent, very adhesive, and flocculent through the supernatant fluid, when shaken. There was no appreciable amount of albumen, and no tube casts were discernible. Under the microscope, there were pus globules, crystals of oxalate of lime, and the triple phosphates. There was never any hæmaturia until after his journey to town, and then it was slight. There were no lumbar pains, or abdominal uneasiness of any kind.

A second sounding took place a fortnight after the boy's admission, but there was a difference of opinion as to the presence of a stone, although it was granted that an abnormal sensation was communicated. The rational symptoms were prominent—painful and frequent micturition, sudden interruption of the stream of urine, the sensation of a stone rolling into the neck of the bladder, pain at the top of the glans, &c. Now a new feature in the case arose. The patient was suddenly seized by an epileptiform fit, accompanied by total loss of consciousness. These fits had occurred at irregular intervals for six or seven years. When attacked he did not scream, but gave a sort of half moan. The whole frame was then thrown into an extreme state of tension; his limbs were fully extended; but his thumbs were not thrown into the palm of the hand. Moreover, the muscles on the left side of the body were almost paralytic, whilst the right upper and lower limbs were most rigidly tense. These fits occurred on many occasions during his stay in hospital. With a view to any operative proceeding, I tried the effects of chloroform on his system: they were identical with the symptoms noted during the occurrence of a fit. I repeatedly sounded the bladder, and frequently detected a stone, but there were many occasions on which I did not feel it. I had the urine carefully tested for albumen, but none could be detected.

Having satisfied myself that I was not deceived as to the presence of a stone, I felt justified in undertaking the operation, particularly as the boy was suffering more and more from day to day. He repeatedly told

me that he felt the stone moving in his bladder—that it entered the neck when he passed water, but never came away. The operation I decided upon was Allarton's. I was unable to put him under the influence of chloroform, or even to tie him, but I was fortunate enough to get instantaneously into the bladder. Before I introduced my finger, a large gush of urine came away, and some of the calculi which I felt before I operated may have escaped. At all events, when I got into the bladder, I felt no stone, nor was I able to detect any detritus or roughness on its walls. I at once introduced prepared sponge into the wound, and had the boy taken to bed. The next day I removed the plug, but found no stone. A considerable gush of urine followed, and one of the pupils thought a portion of the stone had come away, but it was not so.

On the fourth day symptoms of pyæmia suddenly set in, accompanied by delirium, and he died seven days after the operation. The bladder was congested, and the mucous membrane was quite healthy, but there was no stone. The left kidney was remarkable for its size.

As I have said, there was never any symptom to indicate renal disease; but on making a section of the right kidney, there was a gush of purulent urine, and a number of saccules was exposed, filled with calculi (Plate IV.) These varied in size from a walnut down to that of fruit-like particles. The largest was in the pelvis, a few lines from the orifice of the ureter, in which a number of calculi were found on their way to the bladder.

EXPLANATION OF PLATE IV.

Figs. 1 and 2 illustrate the altered condition of the urine in Case XCIV.

Fig. 3. Right kidney in the same Case, sacculated and studded throughout with numerous calculi. In the pelvis is a larger concretion, and in the ureter are several stones on their way to the bladder.

The calculi delineated below were found in the kidney of a woman, who during life complained of anomalous urinary symptoms, principally referred to the region of the kidney. The urine did not present any abnormal character. The largest, of which there is a section, occupied the pelvis of the kidney.

The calculi placed above the test-glasses are examples of the oxalate of lime from another Case.



FIG. 3.



FIG. 5.



FIG. 6.



FIG. 1.



FIG. 2.



FIG. 4.

MR. FLEMING

ON CALCULI IN THE KIDNEY AND IN THE URETER.

One of the curious points in this case was the alternation in the reaction of the urine. When the urine was alkaline, I believe it resulted from the morbid fluid from the diseased kidney passing into the bladder. At times, however, the large block near the origin of the ureter probably quite obstructed the escape of the excretion, and so allowed of the temporary presence of fairly healthy urine in the bladder from the right kidney. These changes are exhibited in Plate IV. There can be no doubt that my diagnosis of stone in the bladder was correct. The calculi occasionally passed along the ureter to the bladder, and were detected there, ultimately escaping by the urethra. That some of my colleagues were not satisfied of the presence of a foreign body, I can only explain by observing that at the time of the sounding none was there, or if so, that the click was muffled by a thick coating of mucus enveloping the stone, as not unfrequently occurs in these cases.

CASE XCV.

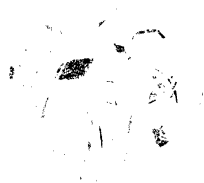
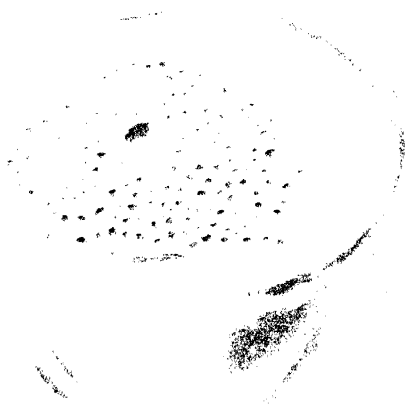
Multiple Calculi in the Bladder.—Continued Urinary Irritation.—Escape of Calculi by the Urethra.

A man, aged between sixty and seventy years, was admitted into hospital, suffering from urinary irritation. This condition had continued for a lengthened time. He had not at any period absolute retention, but there were irregular interruptions of the stream of urine, from the presence of calculi in the urethra. These he had passed frequently, but his symptoms had not diminished in intensity. At the time of his ad-

mission, he was suffering from capillary bronchitis, which ultimately proved fatal. I examined the bladder, and obtained the physical signs of stone, although they were to a certain extent obscured by the presence of calculi along the course of the urethra. The urine was acid; its density 1025, and under the microscope there were the lithic acid crystals as shown in Plate XIII. The *post-mortem* appearances were quite similar to those exhibited in the Plate, which illustrates a case detailed by the late Professor R. W. Smith, in the Proceedings of the Pathological Society of Dublin. The bladder contained urine, and an immense number of small calculi, of globular shape, with smooth polished surfaces. In the kidneys there were a few of similar structure.

I believe that these numerous calculi were renal in their origin, and that they gradually escaped into the cavity of the bladder, where they were slowly shaped by a process of attrition. A few had been caught in some pouches of the prostate, but these were not impacted, as is stated in Smith's case, and had probably been simply arrested in their progress towards the orifice of the urethra. The sections exactly resemble those presented by uric acid calculi; and the composition of the deposit in the urine also points to the conclusion that these numerous bodies did not originate in the prostate, where the concretions, although concentric in arrangement, are chiefly composed of albuminous and phosphatic materials, at least in their earlier stages.

I may state that the calculi referred to in this chapter are to be seen in the Museums of Richmond Hospital and the College of Surgeons.



MR. FLEMING

ON URINARY CALCULI IN THE BLADDER AND IN THE URETHRA.

EXPLANATION OF PLATE XIII.

A complete view of the bladder and penis, with numerous calculi within the former, and in the course of the urethra. The prostate gland, and the transverse bar, are well shown. The sections of the calculi delineate the concentric arrangement. I have copied this from a Plate illustrating the late Professor R. W. Smith's case, because of its almost exact similarity to mine. The microscopic appearances shown have reference to the Case which I note here.

CHAPTER X.

ON THE TREATMENT OF PHYMOSIS.

THE existence of congenital phymosis is much more general than is usually believed, and I have often been surprised at the tolerance with which it is borne. I have seen numerous cases in which the orifice of the prepuce was so tight that the end of a fine probe could not be introduced. The urine, as it is discharged from the urethra, fills up the elongated prepuce like a bag, and then slowly escapes. This condition is often very painful. The orifice becomes tender, and there is much scalding as the urine passes over the inflamed surface. The natural results of sexual connexion are frequently, I believe, interfered with by this deformity, which obstructs the free escape of the seminal fluid. In other cases, again, phosphatic concretions are formed upon the glans, and this part of the penis becomes encased in a calcareous covering, which gradually increases in size, and sometimes gives rise to appearances which, in one instance at least, have been mistaken for malignant disease. I have already referred to the occurrence of stricture in the deeper portion of the urethra as a result of impediments near the orifice.

Many cases may be treated by the simpler method of gradual dilatation ; but where circumcision is deemed necessary, I have devised an instrument which I have found to be of considerable advantage. Every surgeon knows the disappointment which often occurs in division of the parts, because of the inversion of the integuments, as the prepuce is drawn forward so as enable the incision to be made well in front of the glans. By the hooks which are here represented, not only are we able to make a division of the integument and the mucous membrane on the same level, but to dispense with the use of sutures, which I think sometimes retard healing. The instrument is represented of its required length and shape, its hooked ends varying in size according to that of the orifice of the prepuce. The operator should be provided with a curved scissors, or bistoury ; and, if he has not an assistant, with a curved spring forceps. A square of two-fold lint, cut large enough to surround the base of the glans, and shaped somewhat like a Maltese cross, with a central opening for the orifice of the urethra, should be provided, damped with some suitable lotion. The surgeon now passes the hooks within the prepuce, and presses them well down until the resistance of the glans is felt. He then compresses the skin between the finger and thumb of the left hand, and draws the hooks forward, so that the mucous membrane is secured upon them, to the exclusion of the cutaneous covering.



Fig. 31.—
Phymosis
Hooks.

The assistant now gently draws the integument back, so that the natural orifice of the prepuce is well exposed, just at its junction with the mucous lining. The surgeon then, making the parts tense by traction of the hooks, divides the prepuce with scissors or bistoury. The section frequently turns out so satisfactorily that the divided surfaces lie in apposition, the mucous membrane and the skin being accurately adapted to each other. The dressings are now applied in the ordinary way. I have not found any difficulty from hæmorrhage. Should it be troublesome, a little tincture of matco, or turpentine, with perfectly adjusted lateral compression, generally suffices. I seldom use ligature or suture. In cases where a difficulty may arise in passing the hooks through a very close preputial opening, a slight division of the parts will ensure its success.

The dressings should not be changed for forty-eight hours, care being taken to keep the parts cool and moist. Even when the cicatrix has formed, all unnecessary heat and irritation should be avoided for many days, since, should the slightest crack or abrasion occur, the whole tract of the previous wound rapidly ulcerates, and becomes often very troublesome.

CHAPTER XI.

ON MORBID CONDITIONS OF THE URINE IN CHILDREN.

DISEASES of the urinary organs, of such common occurrence in the more advanced periods of life, are occasionally met with in children, modified to an extent sufficient to entitle them to separate consideration. Difficulties often attend their investigation, and the symptoms which characterize their presence not unfrequently escape notice, from the carelessness of the ordinary attendants, and from the oversight of the practitioner. Yet they are a serious and distressing class of affections, and neglect in diagnosis at their earlier formation may lead to protracted misery, and often to incurable disease;—if life in the interim be not compromised. The principal are,—irritable bladder, incontinence of urine, and retention of urine; and, in connexion with them, those morbid derangements in the secretion of this fluid, attention to which is often so valuable an assistant to our practice. These urinary complications are met with as attendants on febrile diseases—whether exanthematous or not—and on their sequelæ; and they are not unusual accompaniments of those chronic ailments, whether glandular, cutaneous, or gastro-enteric, so very common at this period of life. It is, however, to affect-

tions distinct from these that I shall now direct a few observations. I have met with them at all periods of child-life, during lactation and up to puberty, and either sex may be attacked by them; although I am of opinion that they occur more frequently in boys, between the ages of eighteen or twenty months, and eight or ten years. At an earlier age than the former, they are very rarely, if ever, recognised, for reasons too obvious to specify, unless some palpable alteration takes place in the character or amount of urinary excretion.

Irritable bladder occurs much more frequently in young children than would at first sight appear; and this, where the irritability is not the consequence either of inflammation or of organic disease, although occasionally attributable to some abnormal defect. The mother, or nurse of the child, states that it is constantly applying the hand to the organs engaged; that it appears to suffer pain during micturition; that the act is frequent; that it is urgent, but when the urine has passed off the child appears relieved; that often, if the urine falls on the floor or clothes, it rapidly becomes muddy and whitish, and it is even stated by some, that it is so at the moment of being passed; that when the child sits down for such purpose, it has an inclination to remain longer than is usual, and in some cases that there is a disposition to prolapsus of the rectum, from the attendant forcing and straining, and that very frequently a discharge of bloody mucus from the rectum takes place; that these symptoms have continued for some time, not

withstanding the exhibition of medicines to regulate the bowels and produce other ordinary effects; that the child is losing strength and wasting in flesh; that the appetite is most capricious, and that there is a great desire for drink; that the quantity of urine passed is very variable, sometimes deficient; that its quality is equally changeable, at times being pale, at others, deep in colour, and again, clear and often muddy, and with copious sediment.

If accurate inquiry be now instituted, it will be found that many such children are born of gouty parents, or of persons subject to dyspepsia, and that they are children whose diet and habits of life are irregular; and in the humble walks of life that they are, in addition, irregularly clad and irregularly cleansed. The quantitative and the qualitative analysis of the urine satisfactorily explains the symptoms; and attention to the physical condition of this excretion, to its chemical constitution, and to the appearance of the deposits—particularly the deposits of rest—assisted by the microscopic characters, point out the curative indications which are suitable to each variety. It is beyond all doubt, that, as in adult age, many practical hints can be taken from attention to the general constitution of the urine in the surgical diseases of these organs, and that in the child the normal essential constituents of this fluid may be increased or diminished, and that abnormal ingredients may be superadded. We have here the lithic, the oxalic, and the phosphatic diatheses, and each has its special influence. In fact, with few

exceptions—and the presence of sugar in the urine of children is one worthy of note,—there is no derangement of this excretion found in the adult which I have not also found in the child, in its most exaggerated form. I feel satisfied that attention to these details, as subsidiary means, will be found of value in the diagnosis and treatment of many of the diseases of children, and especially in those cases of cerebral complication which so repeatedly puzzle the practitioner, and in which the quantity of urine is either materially diminished or increased.

* As attendant on the “irritable bladder” of child-life, I would say that, according to the classification of urinary deposits by Golding Bird, those of uric acid and the urate of ammonia, and of oxalate of lime, are particularly frequent; and that next in order of frequency are, conjointly or separately with these, “the non-crystalline organized products,” such as blood, pus, occasionally mucus, but very often vibriones. Phosphatic deposits are to be met with, but they do not occur, under ordinary circumstances, as a substantive deposit in the urine of children. The prisms of the neutral triple phosphate are to be seen conjointly with the crystalline deposits above specified, just as in adults, but it is very rare to meet with them as solitary deposits, although so frequent in advanced life; and it is equally rare to find them combined with that physical and chemical condition of urine almost necessarily present under such circumstances. Indeed I find it difficult to bring to my recollection—unless under the most aggravated form

of vesical and renal disease, complicated with calculus in the child—that excessive secretion from the mucous membrane of the bladder which takes so very prominent a part in the formation of such deposit in advanced life. Amongst the numerous cases of urinary disease I have observed in the child, it is excessively rare, and it is equally so as a symptom of calculus in the same class. There was, in one case, a source of deception, which was by the merest chance unfolded to me, and which, perhaps, may be noted as confirmatory of Sir Benjamin Brodie's opinion as to the special source of those phosphatic salts in the urine.

A boy, aged three years, was brought to me in great alarm from the suffering he had endured for some weeks in passing urine. There was frequency and urgency, and so much forcing and straining as to produce distressing *prolapsus ani*. The urine was largely loaded with lithates, and contained a remarkably tenacious mucous deposit, deeply coloured with blood, and adherent to the glass. I found in it numerous blood discs and large crystals of the triple phosphate. Symptoms not improving, I felt justified in sounding the child, which I did with a silver catheter; and whilst the urine was flowing, a severe paroxysm, resembling a fit of the stone, occurred, during which a considerable quantity of gelatinous mucus escaped from the rectum. I collected the urine drawn off through the catheter in one test-glass, and the discharge from the rectum in a second. The urine was acid, the latter alkaline; the former was loaded

with lithates interspersed with some crystals of oxalate of lime, the latter, in addition to mucus, blood cells, and epithelial scales, was studded with large, distinct, triple phosphatic prisms.

I have said that the lithic acid and lithate of ammonia deposits, and also that of the oxalate of lime, are the most frequently met with in children, and they will be found to be productive of most decidedly distressing urinary symptoms. I have often found these deposits present conjointly; very often the oxalate of lime and the urate of ammonia, the latter cloaking the former, unless carefully looked for. I have seen the red sand, as the lithic acid is sometimes termed, in the child; but it is far more frequent to find the colourless, or nearly colourless, crystals of lithic acid. All are met with, of every variety of shape and form. It does not appear that diet very materially influences their presence or their character. I had a boy, aged about seven, with suspected calculus in the bladder, and in his urine numerous crystals of pale lithic acid existed, in combination with oxalate of lime; whilst in another boy the red sand was visible to the naked eye in the test-glass, floating through the urine. It is in this class of deposits, and in that of the oxalate of lime, that the surgeon requires to be more circumspect, as the physical and chemical characters of the urine are often not remarkable. The colour is in such cases pale; the density very low, 1007 to 1010; the deposit a mere tomentous, semi-transparent cloud. The suffering experienced in some cases of this nature is very great; and if the child happens to have a long

narrow prepuce, or an abnormal opening in the urethra, he may be put to unnecessary torture from inattention to the morbid state of the urine. I have known such cases: one, a fine child, the son of a father who lived freely, and thought the child should do so too; the other, a boy aged three years, with hypospadias, from which the child had not previously experienced any visible inconvenience. In each the usual traces of symptoms of irritable bladder existed; the ordinary clear condition of urine diverted attention from the examination of its actual state; and its normal restoration caused the subsidence of all annoyance.

I do not dwell on the lithate of ammonia deposit; its characteristic appearance is too obvious to require any comment. I shall merely add, as regards it and the other crystalline deposits noted, that when from their continued presence they produce local or general irritation, they demand care to put rigidly in force those dietetic and therapeutic remedies which are laid down in systematic treatises. If the symptoms do not yield, the surgeon should search for some local cause, either in the bladder, or in some portion of the organs implicated; and bear in mind, that urine of such character is the most likely to lead to the formation of stone in the bladder, as proved by its composition in the child, and by the fact of its being the most common attendant on its presence when found there. Hence two practical lessons should not be lost sight of—namely, to alter, as quickly as possible, this morbid condition of urine, and to suspect the presence of calculus, should it be obstinate.

The cases in which we meet with blood, mucus, pus, or epithelium, in the urine of children, apart from general disease, or as isolated or substantive urinary affections, are comparatively rare. In the ordinary diseases of children, acute and chronic, urinary deposits of this class are to be constantly found. The surgeon should, however, be prepared for the fact, that some cases will present themselves in which no such complication exists. I have known boys pass blood from the bladder, and yet they were apparently enjoying excellent bodily health, and in the intervals were free from any appreciable urinary irritation. The same statement may be made as regards pus. The history of a few cases will illustrate this.

A boy, aged about nine years, fell from a height; and, amongst other symptoms, it was observed that his urine was bloody. It was supposed to be the result of the injury, and yet the boy complained of no local uneasiness, neither did he manifest any lesion to account for such complication. I doubted the statement made, when the child mentioned that on two or three occasions before the accident he had observed his urine similar in colour, without being able to attribute it to any particular cause, and that the urine spontaneously resumed its natural appearance. I watched the progress of the case, and made the boy pass water in my presence. It was as dark as coffee; and, on examination, was found to be loaded with blood cells. The result proved the accuracy of the boy's statement.

I have notes of another case, in which intermit-

tent attacks of hæmaturia (the blood being of a bright arterial hue) occurred in a boy aged between six and seven years, possessing all the semblance of health, and in which the hæmaturia was provoked by the most trifling causes, was unaccompanied by pain or uneasiness of much moment, and ultimately almost spontaneously subsided.

Although it would appear from the report of these cases that blood may be present in the urine of children, in large quantity, and yet be productive of not much local or general distress, we are to keep in mind that bloody urine may be pathognomonic of renal disease, and that disease sometimes malignant. I have examined the urine of a child, containing a large amount of blood, the child dying under twelve months old, of encephaloid disease of the kidney. Blood alone, however, is a rare addition to the urine of children, except as the result of injury, or traceable to calculus in its passage along some portion of the urinary tract: nevertheless, it is a very rare attendant on stone in the bladder in the child.

With regard to pus, it is far more frequently met with in the urinary diseases of children, and it is surprising how tolerant both the general health and the bladder are of its presence. Unless very particular inquiry is made by the surgeon into the history of the case, such a complication will wholly escape detection. Cases of this kind occur in both sexes. In girls, as in grown-up females, very much circumspection is requisite as to accuracy of diagnosis. I make a similar remark as to hæmaturia.

When pus is persistent and obstinate, local inspection must be made in the female child, as morbid secretions from the vulva and vagina are not uncommon in such children if badly cared, and the urine *in transitu* will be loaded with pus cells, mucus, and even with an amount of phosphates sufficient to render it neutral or alkaline, and this quite apart from urinary disease, although attended with much urinary irritation.

The following case is a good illustration. A girl, aged about ten years, was brought to me, the mother stating that she suffered from pain and frequency in micturition, and that her urine was offensive in smell and whitish in colour; that her general health was tolerably good, but that her present ailment was so distressing as to prevent her from attending school; that her bowels were regular and her appetite fair. No other particulars were noted by the mother, though she appeared to be an intelligent woman. I directed some simple aperient, and desired that some of the urine passed on the following morning should be brought to me. I took the following notes of it:— Colour, muddy and whitish; odour, offensive and sour; reaction, almost alkaline; density, 1015 to 1018; deposit of rest, opaque, greenish-white stratum about one-quarter of an inch in depth at bottom of glass, and with defined upper surface; supernatant fluid clear, and of a light straw colour.

The density of the specimen, and the colour of the supernatant fluid, led me to suspect that the origin of the pus was not from the urinary tract. Under the

microscope, pus cells were seen in abundance. There were also some mucous cells, and a large amount of epithelial scales. Amongst these were interspersed granular masses of phosphate of lime, and some few crystals of triple phosphate prisms.

On the next visit I made more particular inquiries, and found the mucous membrane of the vulva and the whole pudenda swollen and villous, and absolutely soddened with fetid sero-purulent discharge. A drop of this under the microscope showed myriads of pus cells, epithelial scales, and granular masses of phosphate of lime. It restored the blue colour to reddened litmus. Now, drawing off the urine through a catheter, it was found acid, and free from more than a few pus globules, but loaded with lithates.* Attention was paid to the local affection; astringent lotions were directed, and cleanliness enjoined, and in a short time the vesical symptoms disappeared.

Irritability of the bladder in girls may arise from another source than that of general engagement of the vaginal mucous membrane in the secretion of pus. I allude to an ulcerated fissure of the vagina, resembling a similar affection engaging the rectum in the adult. The agony attending this can hardly be exaggerated: the principal suffering is referred to the bladder, and the pain during and after micturition is most acute. It is also quite intelligible that the whole mucous membrane of the vagina, in consequence of this partial

* In adult life, where leucorrhœa in females is attended with vesical irritation, I have derived much assistance in diagnosis from a similar proceeding.

ulceration, may become secondarily engaged, and that the purulent secretion will be proportionably profuse.

As far as my experience is concerned, however, cases of purulent urine in children occur more frequently in boys than in girls. They are, in many instances, strangely tolerant cases, and strangely obstinate. Some of them have a resemblance to those of hæmaturia I have noticed, as being somewhat intermittent in their character, and in not being productive of any considerable local or general irritation. I may instance the following :—

A boy, aged about twelve years, rather delicate in appearance, and somewhat strumous in aspect, complained of irritability of the bladder, and described the urine he passed as having the colour of milk diluted with water, or muddy whey. He stated that such had been the case, with irregular intervals of a freedom from pain and clearness of urine, for more than twelve months, but that he was, notwithstanding, obliged to leave school in consequence of the irritability of his bladder : that he could only attribute the attack to damp and cold. I tested and examined his urine. It was loaded with pus globules to an amount so great, that the deposit of rest occupied nearly half an inch of one of my ordinary test-glasses,—namely, between four and five inches in height, and about one inch in diameter. Yet the boy did not appear to suffer materially in general health. I procured his admission into hospital, and examined his bladder. I could not detect any local cause to account for his complaint. He left the hospital, benefited by the

exhibition of uva ursi, alternated with buchu and the mineral acids, but he was not cured.

In the case of a boy aged seven, the irritability is extreme; the agony excruciating towards the end of micturition, and the act only tolerable in the sitting posture. The pain he describes as cutting; he refers it to the bladder and to the glans penis, and tries to relieve himself by pulling and pinching the prepuce and end of the penis. The child moreover states that there is often a sudden interruption to the stream of urine, and that by changing his position it recovers itself, and then dribbles off. In observing the passing of the urine, its muddiness throughout the whole act of micturition is obvious, and the quantity discharged is very variable, but always small. There is no incontinence; there is no prolapsus. The penis is somewhat largely developed, for the age of the boy. He complains of no pain or uneasiness in the lumbar region. I may add, he has a symptom which, in cases of this description, I have not unfrequently observed, namely, great tenderness on pressure and on percussion in the supra-pubic region.

The disease is stated as being of more than twelve months' duration; and the boy, who is very intelligent for his age, is disposed to attribute the supervention of the attack to his being obliged to keep his bladder painfully distended during school-hours. When he had the opportunity of emptying it, he required to force and strain considerably, and often he could not for a time discharge any urine. Gradually the train of symptoms set in, and became more intense; and his

urine has been often mixed with blood, and latterly has become of a whitish colour. The character of the fluid I have carefully noted, and it is that which will be found most usually present in such cases. It was examined within a few hours after it was discharged, and was as follows:—Colour, muddy and whitish; reaction, acid; density, 1010 to 1012; deposit of rest, an opaque, greenish-white stratum, abruptly defined at its upper surface, and about one-fourth of an inch in depth at the bottom of test-glass. Supernatant fluid almost aqueous, nearly transparent, and, within a limited period, uniformly miscible with deposit. Under the microscope, numerous pus globules visible. No fibrinous or tubular casts; no epithelial *debris*; no phosphatic deposit.

The bladder was examined with a view to the presence of calculus, but none was detected: and I stated beforehand that such would most probably be the case, from the consideration of the peculiar morbid condition of the urine, with the existing symptoms, although the rational signs of stone appeared very prominent.

I do not attempt to assert that stone in the bladder, when attacking children, may not be accompanied by a purulent condition of the urine; but I am certain that it will occur very rarely, if ever, where urine of the character noted in the case just detailed is present.

I have often thought that purulent urine was occasionally vicarious in the child as in man, and especially in those pyogenic conditions of the system so common in the earlier periods of life, as evinced by glandular

suppuration and chronic abscess. From the patients to be dealt with, it is not easy to carry out investigations on this subject accurately, but I have reason to think I have seen cases of the kind. I do not wish, however, to speak too confidently on the matter, as the statements of attendants cannot be depended upon, unless the specimens of urine are procured with great care—and this is as requisite in private as in hospital practice,—and unless they are minutely examined under the microscope. Copious deposits of urates, in these cases, are by no means unusual, and general statements made respecting the external characters of the secretion would be deceptive. This investigation may be more interesting in a physiological than in a practical point of view, but there are cases in which our prognosis must be materially influenced by it; at all events in advanced life.

Here a question of much practical importance suggests itself as regards the source from which the urine acquires its purulent character; and the same question may be asked regarding blood. Too frequently here, the symptoms which the French term “commemorative symptoms” are so defective in the cases of children that it is very difficult to solve such questions. A great deal must, therefore, depend on the accuracy of observation of symptoms as they present themselves.

In the strictly surgical application of the term, renal hæmorrhage is a rare disease in children. One case has been noted where malignant disease of the kidney originated it. Again, the symptoms of nephritis and

nephritic calculus are as obscure and as equivocal as they are unusual in children. Pyelitis is equally rare; so that the subject is surrounded with very considerable difficulty. I have had great assistance in diagnosis from attention to *the condition of the urine as it escapes in the act of micturition*, and afterwards to the prominent features in its examination notified. *The uniform miscibility of blood or pus with urine, whilst passing from the urethra, is an invaluable guide in estimating their source*; the peculiar colour or tinge of the former *then*, and when *the deposit of rest* forms, is equally so; and as regards pus, the surgeon will acquire much information by attention to similar details. He will see that in nearly all cases of purulent urine in children, the change in the fluid is obvious throughout the whole act of micturition; and this alone, independent of the examination of its morbid condition, will lead to more than a suspicion as to the source and extent of disease. In the case of a boy under my care, I apprehend there is a complication of renal disease, although no complaint is made of any lumbar pain or uneasiness, and no particular fulness or tenderness exists on examination. Pathology teaches us how deceptive symptoms are as to the actual existence or site of organic lesion of the urinary apparatus even in the adult. In a case of irritability of the bladder in the adult, I have found the kidneys extensively diseased, and the bladder healthy, apparently, although the latter was *nominally* the seat of all the suffering of the subject of it. The same occurs in the child. Irritable bladder in the child, accompanied by purulent urine, has in some in-

stances been found to be attributable to tuberculosis of the kidney, and not a trace of disease in the bladder has existed.

In other instances, again, this tubercular form of disease has had its seat in the vesical mucous membrane and in the submucous tissue, forming large prominent tumours, of varied consistence, projecting into the bladder, which was proportionably contracted, with its mucous membrane congested and villous in some cases, in others frayed and ulcerated to a greater or less extent and depth, and presenting an appearance very different indeed from that trabeculated or columnar condition accompanying ordinary forms of disease in the adult. This condition of the bladder is not isolated; the kidneys partake of the same character of disease, and ultimately the sufferer must fall a victim to it singly, or conjointly with more general tubercular development.*

This is, however, the extreme case. Others are to be met in which disease is limited to one portion of the bladder, and in which it is reasonable to suppose the affection is curable. In our prognosis we shall be materially assisted by attention to those conditions of the urine noted in the cases detailed. It must be most unfavourable when the combination of pus, blood, and mucus co-exists, or even of blood and mucus, and especially if the density of the urine

* There is a preparation in the Museum of the Queen's College, Belfast, which shows these morbid appearances; and there is one also in the College of Surgeons here. The disease resembles much a similar affection in the rectum of young children, and is decidedly strumous in its nature.

is low, and continues so; if its colour is aqueous, the smell fetid, the re-action alkaline, and the deposit phosphatic; and if the morbid conditions of the urine are attended with lumbar or nephritic pains, and general symptoms of urinary hectic. These symptoms are not peculiar to irritable bladder attended with purulent urine, and referrible to the form of disease described. Similar symptoms will present themselves in cases of calculus, where the phosphatic diathesis predominates, and hence great caution is required in the diagnosis, lest the operating surgeon should confound them, and so compromise his character. I could bring forward cases in which the operation of lithotomy was declined, from the conviction that the rational symptoms of stone, though strongly marked, were all attributable to general urinary disease, as proved by subsequent *post-mortem* examination; and others, in which persistence in opposite views led to most distressing and unsatisfactory results, from non-detection of stone after the operation of lithotomy; and equal ill success as regarded it on the fatal termination of the case.

Within the last two years two cases have occurred to my knowledge, in which the operation of lithotomy was declined, from the impression that this special form of disease existed, to the exclusion of stone in the bladder. In one of the cases the boy was aged ten years. The rational signs of calculus were particularly well marked, and, amongst them, the penis was most remarkably enlarged. The paroxysms exactly resembled those attendant on a fit of the stone. The urine

was muddy whilst being passed, and bloody towards the end of micturition. Its density was 1005 to 1008; its re-action feebly acid; its deposit, characteristic of blood, -pus, and mucus: the latter so considerable as to cause firm adhesion to the test-glass. The pus globules were in abundance, also the blood. The diagnosis given was disease of the lining membrane of the bladder, and renal complication. The boy died of urinary hectic. The bladder exhibited marks of extensive disease, implicating the mucous membrane, which was much ulcerated in different portions. The kidney contained strumous abscesses in isolated patches; not a trace of stone. As regards the second case, I believe the child is yet alive, but the symptoms of stone are so characteristic that it is with some difficulty the disposition in the surgeon to operate is controlled. In neither of the cases were the physical signs of stone manifest.

It is unnecessary to state that irritability of the bladder is no uncommon attendant on the ordinary worms of children; and I may add, that the remedy I find very beneficial in these cases is creasote. I have been in the habit of giving it for the last few years, in combination with the common aperient of children, with very great benefit; and in the irritable bladder of children I constantly direct it, with or without calomel, according to circumstances.

In dispensary practice these urinary affections are not very manageable; indeed it is not to be wondered at that our treatment is not particularly successful as regards them. The state of the skin, as to warmth

and cleanliness, must be attended to, and also diet; and I need hardly add, that the subjects are badly clad, and badly fed, and they are little disposed to take medicine, or persist in its use; and more, that their parents are often perfectly listless as regards the directions given them, or even the presence of their ailment.

I shall not enter into the details of the therapeutics suited for these cases. I have found buchu and uva ursi, with lime or magnesia water, or with the nitric or hydrochloric acids, in suitable doses, of great benefit; and I have combined them with hyoscyamus. In the chronic cystitic affection—for I believe it often to be of that nature—cod-liver oil, alternated with those preparations of iron fitted for children, do much good; and mild counter-irritation in the supra-pubic and lumbar regions with the tincture of iodine will materially assist their action. Sea air, and tepid or cold bathing, as may be suited to each patient, are most valuable in many cases.

In addition to these general and local means, it is indispensable to attend to the state of the bladder. Its capability of discharging its contents must be tested occasionally, and such operation must be performed very gently, and with a gum-elastic catheter. I am under the impression that in all painful urinary affections children do not empty their bladders fully, and the very position which they select for the purpose shows that they circumscribe as much as possible the action of the abdominal muscles, so as to measure with more precision the amount of contraction of blad-

der suited to alleviate their sufferings. In the posture they adopt they absolutely prevent much pressure of these muscles on the parietes of the bladder, in them so liable from its position to be affected thereby; and, therefore, in calculus, and in the disease under consideration, there is not a diminution of capacity to the extent to be expected from the repeated action of that viscus. In such cases I have often tested the bladder as to its contents after the child had made every effort to empty it, and in it I have repeatedly detected from two to four ounces of urine: even without the introduction of a catheter I have found that percussion in the supra-pubic region will enable the surgeon to estimate the amount of distention. I am particular in alluding to this practical fact, as a knowledge of it is important in treatment.

In other instances of irritable bladder, notwithstanding all the curative precautions adopted, and attention to the character of the secreted fluid, the symptoms of the disease advance, the bladder becomes seriously engaged, and even retention of urine may supervene; and all this from a local cause which the inspection of the surgeon could at once detect, and which, strange to say, often escapes the notice of the daily attendants on the child. I allude to some abnormal defect in the genital organs in the immediate vicinity of the urethra, in the labia, or nymphæ, or prepuce of the clitoris of the girl; in the prepuce or orifice of the urethra in the boy. I have already referred to this in a girl, in Case XXIV.

Where local circumstances exist in boys, to which

are distinctly referrible the symptoms I have above enumerated as attendant on irritable bladder, the value of the remark of Sir Benjamin Brodie is particularly striking—namely, “to combine with the observation of symptoms the study of morbid anatomy” (we may here substitute “abnormal anatomy”), otherwise we are apt to confound with one another affections which are essentially different, under the general appellation of irritable bladder, and torture our patient with remedies worse than useless. I put completely out of the question, for the present, any derangement in the healthy character of the urinary secretion. I will assume that the surgeon is acquainted with it, and that he has adopted the requisite remedial agents; but he is yet unsuccessful; the irritability continues, and if any change have taken place, all symptoms are aggravated, and this although the urine may be restored to its normal state. Whence the cause of this? Let the surgeon examine the penis, and he will frequently get a clue; let him place the child before him, and make him pass water, and let him cast his eye on the appearance of the penis, both before and during the passage of the urine. In many cases he will find that the orifice of the prepuce is at a considerable distance from the extreme end of the glans; that that orifice is so small as to admit with difficulty the end of an ordinary probe; and that when the child makes water, the urine does not escape in a uniform stream; that it is scattered, and that during its transit the prepuce is distended into a pouch by the accumulation of the urine within it, the glans being at a considerable

distance behind. Such a state of organ will not necessarily entail symptoms of irritable bladder. The contrary, as in the case of the female child already noted, may be the fact; but I affirm, that when deranged action or function of the urinary system arises, no matter from what cause, the presence of it will be found to be often attributable to the lesion I mention. No *permanent* cure will or can be effected, if it is overlooked; nay more, on a careful revision of the cases which came under my observation, I am disposed to go farther, and to state, that on the supervision of disease, a more aggravated character is traceable to it. Who will deny that cystitis and its uncertain consequences may not arise from it; that stricture may not result from it; that retention of urine, and even calculus, may not be superinduced by it?

As regards the treatment of such cases, the division of the prepuce may be ultimately required; but from the results of such operation in children, trifling as it is, I am disposed to prefer mechanical dilatation of the orifice of the prepuce by the occasional insertion of a piece of prepared sponge, or tangle bougie, for an hour or so, or by the careful retraction of the prepuce on the glans during micturition. Much success has attended this expedient.

One of the most distressing cases I have witnessed, of irritable bladder arising from these abnormal defects, was where an excoriation took place at the orifice of the urethra, in that deformity termed hypospadias. The mother was ignorant of the condition of

the organ; ulceration had occurred, and the subsequent cicatrization had so completely closed the orifice that it would admit only the finest probe. The severe distress present was removed by a slight division of the delicate membrane surrounding the orifice, and the securing of its permanent patency by a piece of bougie.

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